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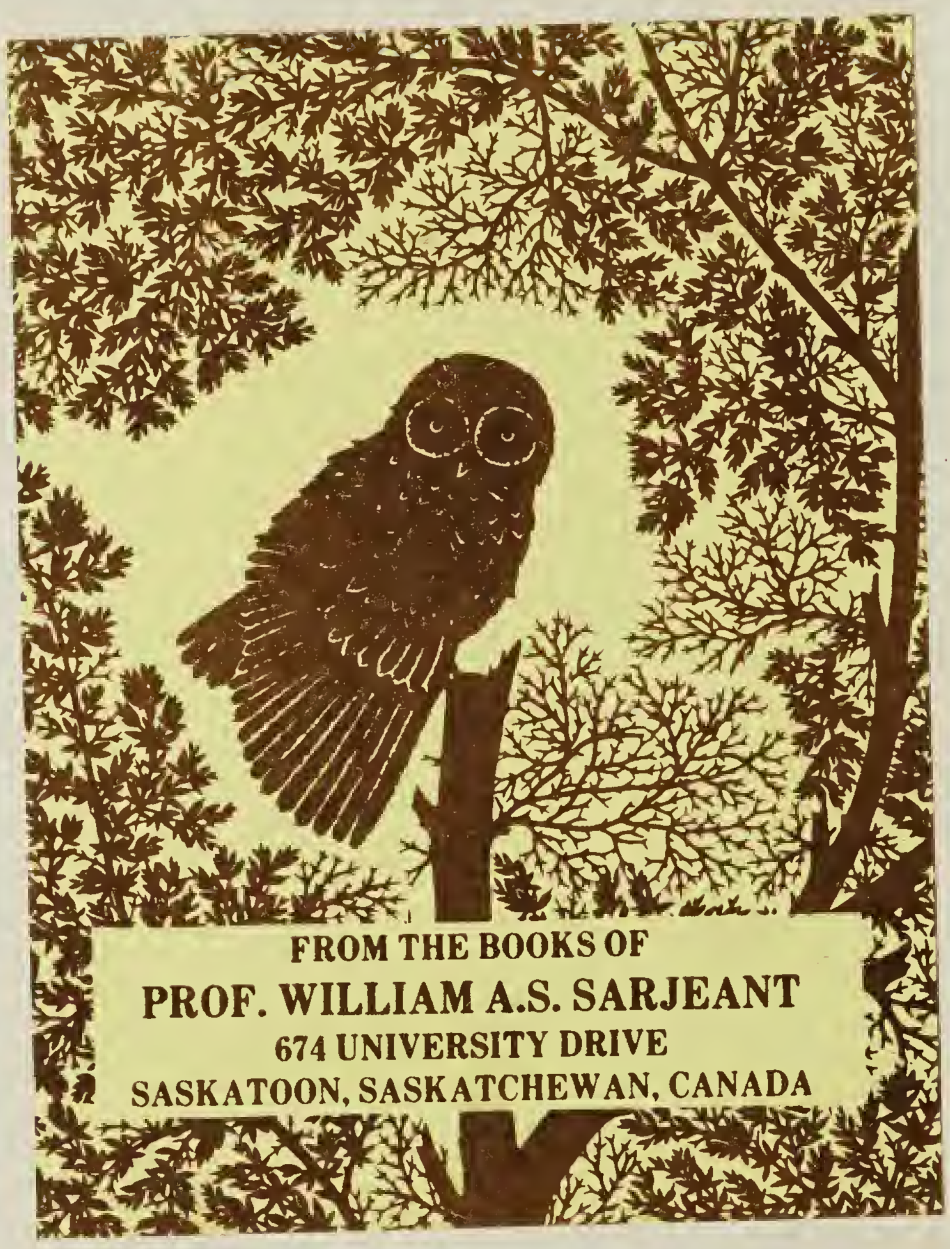

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Blue Jay

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ADDENDA

Two corrections for the December, 1974, issue:
P. 218. Correct spelling: D. W. A. Whitfield
P. 255. Correct identification: White-tailed Jack Rabbit

* * * * *

GREY OWL PHOTOGRAPHS: Little is known about these photographs, kindly supplied by Ron Dutcher, Park Naturalist, from the Prince Albert National Par files. They were taken at or near Ajawaan Lake in the park, probably in th 1930's and likely by W. O. Oliver.

* * * * *

Shamrock Orb-Weaver (*Aranea Trifolium*) Al Grass

THE STORY OF GREY OWL

by ALEX ZELLERMEYER*

Ie was an Indian. He was a half-ed. Or was he an Englishman? He an author, a naturalist, a lecturer. man presented to Prime Ministers Kings. He was a drunkard. haps a bigamist?

o most people of the past and, untunately, even the present, he was a stion mark. A man known more by nor than fact — judged more by sip than reality. Where does the th lie?

E EARLY YEARS. The story of Grey l began far from Prince Albert tional Park. It started in 1888 with birth of Archibald Stanfeld laney in the southern English stal town of Hastings.[1] Decades uld pass before Grey Owl would erge.

rchie's early childhood was typical most English school boys at the end the 19th century. His education was oked after by the two maiden aunts o had raised him from infancy. Are was particularly talented on the no.[2]

ike most schoolboys of his day, Are lived a constant daydream of exriencing the world of the North nerican "Wild West". These dreams becoming an Indian pathfinder — a nter — were to follow him from ldhood through adolescence and, ntually, to manhood.

y the age of 17, Archie was too tless to remain in Hastings with his aging aunts. The thought of settling into the local office clerk's position he seemed destined to occupy encouraged his growing wanderlust. In 1905, Archie Belaney booked passage on the S.S. *Canada* from Liverpool, arriving in Canada in April of that year.[3]

At the turn of the century, northern Canada was a country of wildlands, occasionally broken with mining towns, lumber camps and train stops on railroads to places of greater importance. Into this Ontario northland came Archie Belaney. At a small rail stop called Temiskaming, Archie made friends with the local Indians, trappers and guides.[4] They were mostly of Ojibway origin, a people to whom Archie would alway credit his woodland talents. It was here that over the years that Archie Belaney learned the arts of trapping and wilderness life.

In 1910 Archie married his first wife, a young Ojibway girl named Angele.[4] The marriage was to last for only a year. Archie's restlessness, which he felt whenever he became too "settled", was a personal uneasiness which would haunt him for his entire life. However, the Ojibway customs of marriage were simple. A couple remained together for as long as they desired or parted whenever they wished.[5] Archie was taking on more of an Indian identity with each passing year.

Little is known of Archie's life from the period 1910 to 1915. He spent one winter with his second wife, Marie Gerard. He worked with the Ontario Forestry Department near Biscotosing where he had the occasional run-in with the local constabulary.[6] Archie was fond of "whooping-it-up".

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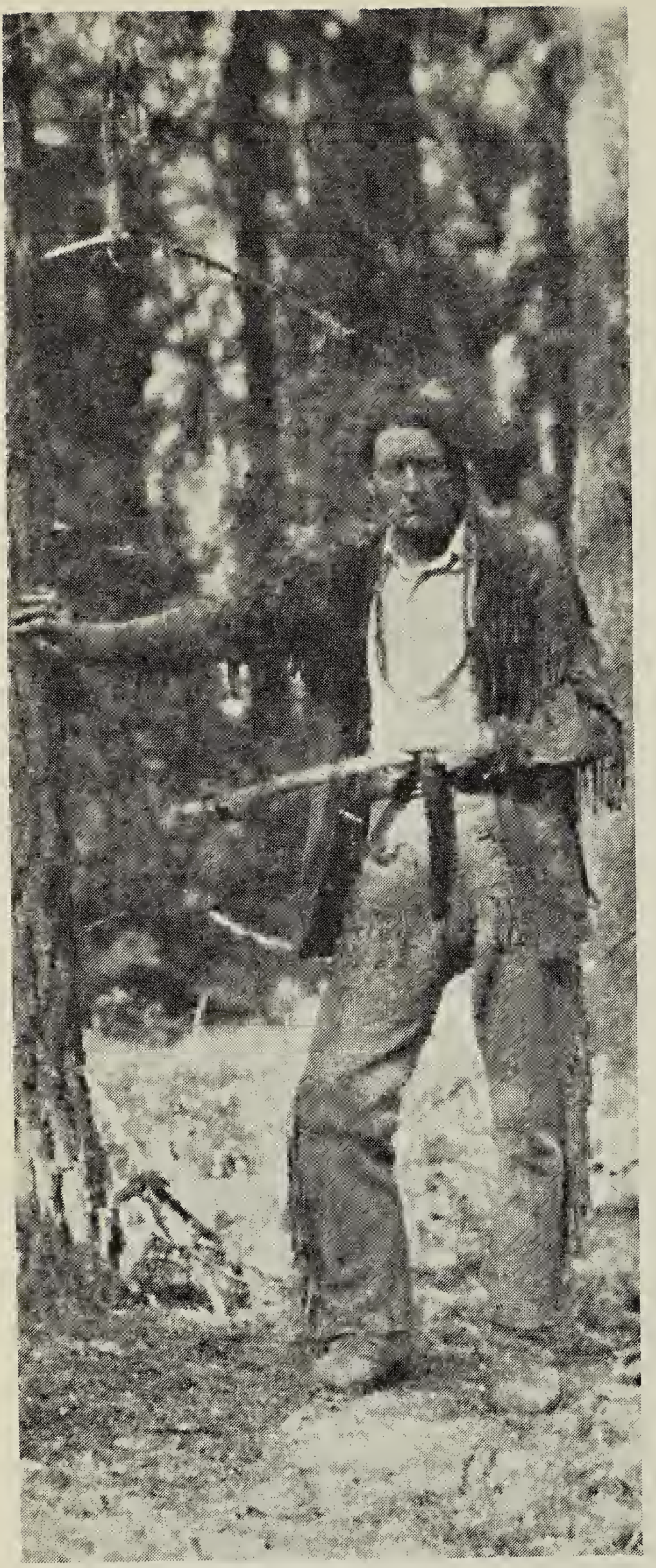
ince Albert National Park,
askesiu, Saskatchewan.



PRIVATE BELANEY. The onset of World War I saw the first Canadian contingent fighting under their own command and colours. Listed with this Canadian Expeditionary Force was Private A. Belaney. In France, Archie was wounded and subsequently sent to England for convalescence.[7] Back in his boyhood country, he spent over a year renewing old friendships and memories. One of these was his childhood sweetheart Ivy Holmes. In 1917 they were married.[8]

It was here that Archie must hav finally decided that a well-ordere life, especially a rigid English on could never truly satisfy him. After months, the couple decided to dissolv the union.[8] Archie Belaney wa Canada-bound for a second time When England saw him next it woul be as the triumphant Grey Owl.

GREY OWL. Back in the Ontario north woods near Biscotosing, Archie returned to the life of a trapper and guid It was in 1920 at an Ojibway gatherin that Archibald Belaney gave up hi Christian name. With his hair long an braided, clothed in buckskin, he chos the name Wa-sha-Quon-Asin, the Gre Owl.[9] Not until his death would i emerge that he had ever been know by another name.

Now, as Grey Owl, he continued hi trapping. It was circumstance tha returned him in 1920 to th Temiskaming area where he met Gertrude Bernard, a young girl o Iroquois descent. Grey Owl called he Anahareo — her ancestral name. Afte several months of correspondence the were married.[8]

PILGRIMS OF THE WILD. By the tim Grey Owl had met Anahareo he wa familiar with the value systems of th Ojibway, with their customs, and wit their language. He was, for all inten and purposes, an Indian in bot manner and appearance — especiall in appearance. Even his blue eyes an flawless English did not lessen the impact of this tall, long-haired man i moccasins. With a single eagle feather hanging from his braided hai and a determined scowl perpetually o his face, it appeared as though he ha stepped from the very pages of thos books he had read long ago i England.

These early years with Anahare changed Grey Owl from trapper t conservationist. In the overhunte trapping regions of Ontario an Quebec, Grey Owl found it in easingly difficult to trap for a velihood. Since 1670, when the .B.C. ship *Nonsuch* sailed from ngland to the new-found fur lands of hat was to become Canada, the eaver had started a slow but steady pulation decline. Two hundred and ty years later, in Grey Owl's time, it emed as though the last refuge for r national animal was destined to be the Canadian nickel.

One spring, Anahareo found two oraned beaver kittens. Their parents d been trapped, and it appeared that e fate of these kits was bleak. The ung couple adopted the orphans.[10]

Grey Owl was so moved by the inlligence and loyalty of these "beaver ople", as the Indians called them, at he became more concerned with nding measures to protect them, ther than better methods to trap em.

It was then that Grey Owl's fortunes proved. A nature article he had subitted to an English journal, *Country ife*, gained immediate recognition.[10] he publishers were only too eager to learn more about this eloquent half-breed from Canada's backwoods who went by the name of Grey Owl. They asked for more.

At the same time, Grey Owl agreed to lecture to an audience at Metis Beach.[10] By the end of the summer of 1927, the attention he had received convinced Grey Owl that conservation was to be his life's work.

A NATURALIST IN THE NATIONAL PARKS. Success followed success. Grey Owl completed a series of articles for *Forest and Outdoors* while *Country Life* began negotiations for his first book, *The men of the last frontier.*

In 1931, Grey Owl accepted a position with the National Parks Service as a naturalist. His project — to re-establish beaver colonies in areas of the National Parks from which they had been long exterminated.

Thus, in April of 1931, Grey Owl arrived at Riding Mountain National Park in Manitoba.[11] Unfortunately, the local conditions for establishing a beaver colony didn't meet Grey Owl's

requirements and a transfer was requested.[11] It was because of this that on October 27, 1931, Grey Owl, with Anahareo and the two beavers, Rawhide and Jellyrole, arrived in Prince Albert National Park.[11] Here, on the seldom visited shoreline of a small lake called Ajawaan, a cabin was built. Grey Owl called it "Beaver Lodge". The name was more than appropriate. Rawhide and Jellyroll had built their mud lodge against it, and after a hole had been cut for them through the lakeside wall, they completed the other half of the lodge inside the cabin itself.

It was at Ajawaan that Grey Owl emerged from relative obscurity to become the celebrated Indian author and conservationist. He wrote articles and answered requests which never seemed to end. Streams of letters from the corners of the world flowed to Ajawaan.

During this period, 1932 to 1934, Grey Owl completed his best known work, *Pilgrims of the wild*.[12] It was in this book that he told the story of Anahareo and the two orphaned beaver kits. It was also here that Grey Owl attempted to express his source of inspiration — the Canadian wilderness. *Pilgrims of the wild* was translated into eight languages so that there were few people in the western world who had not heard of the "Beaver Lodge" of this Canadian backwoodsman.[13]

In 1935 Grey Owl agreed to his publisher's suggestion that he go on a lecture tour — destination: England.[13] Thus he returned to the country of his birth in beaded buckskin. Tall and stern-faced, he stood in front of more than a quarter of a million people on that tour alone.[12] He filled and refilled theatres and still people were turned away for lack of space.

The tour was so successful that more were planned. On a subsequent lecture series in England, Grey Owl made a command appearance before Kin George VI and the Royal family.[14] Afterwards, having been asked for te with the sovereign, Grey Owl bade th king goodbye with a "Farewel brother" and a hearty slap on the bac For the former Hastings resident thi must have been more than memorable occasion.

It is difficult to tell if Grey Owl himself realized the following he ha created. His work on beaver conservation was continued throughou Canada, and because of the attentio he focussed on preservation, a countr whose existence was founded o resource extraction was quickly warned that if her successes were to continue, she would have to adopt a mor moderate attitude to the land. As h put it . . .

> "I think the Canadians take thei priceless heritage of the Nort rather complacently for granted Well, they want to watch it, or the soon won't have it. The policy the are pursuing in regard to its exploitation and to a very much lesse degree, its preservation, is lamentably short-sighted.[15]

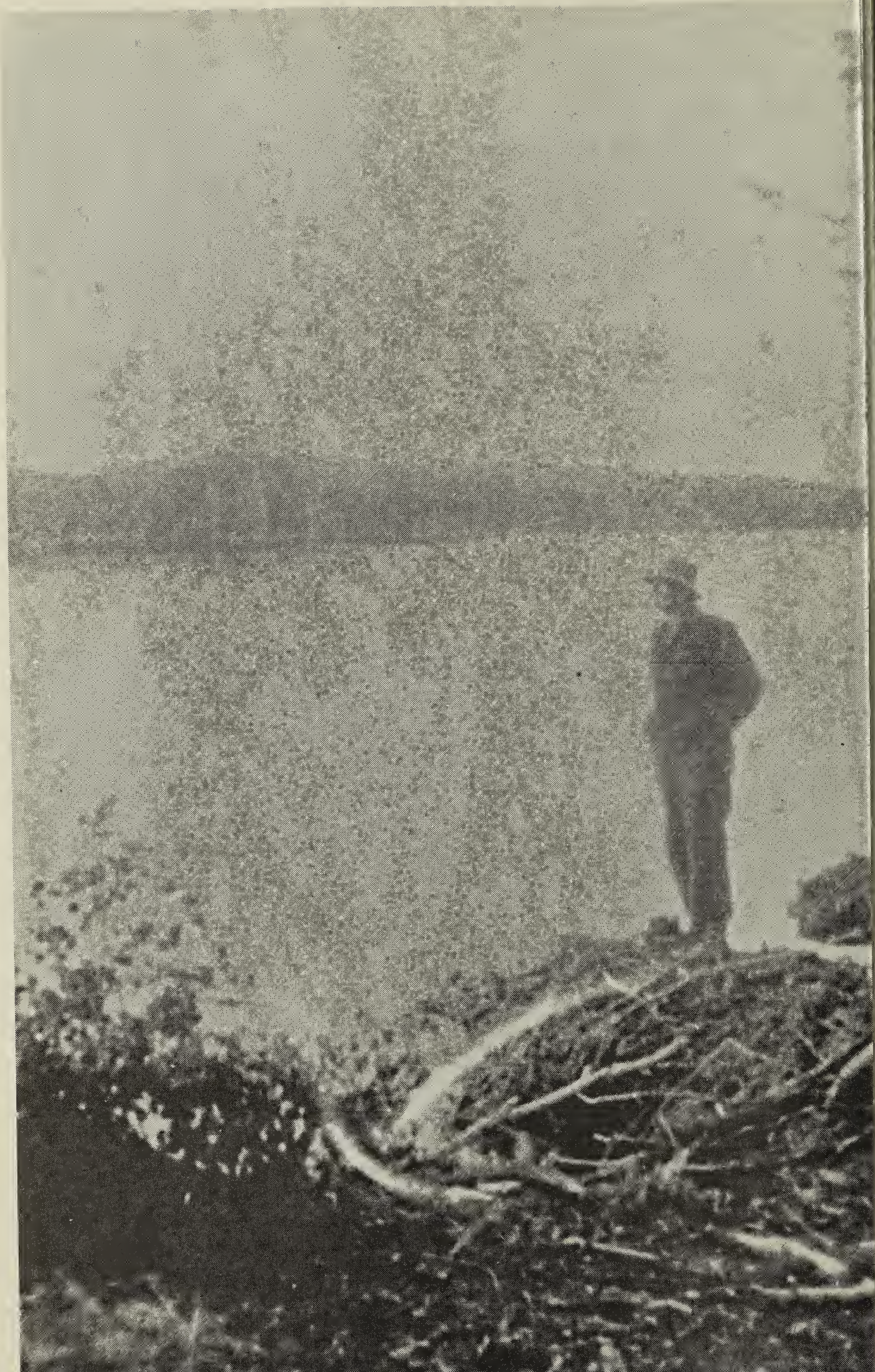
THE PRICE OF FAME. The lengthy lecture tours, writing schedules an world publicity also took their toll. I 1936 Grey Owl and Anahareo agree to part. Later that year he married hi fifth wife, Yvonne Perrier, and completed his last book, *Tales of an empt cabin*.[16]

In the autumn of 1937 Grey Owl undertook another European lectur tour. Returning to North America, h immediately started yet another lecture series in eastern Canada and th United States.[8] The pressures of hi travels, writing deadlines, and his lif style wore away Grey Owl's health. A he told one reporter in Ontario, on more month of this "will kill me".[17] I did. A month later, April 3, 1938 Grey Owl passed away in a Princ bert hospital after being found unnscious on the floor of "Beaver dge". He had pneumonia.

EY OWL EXPOSED. The day after his ath Grey Owl was exposed as an nposter".[11] It had been only a matter time before someone connected him Archibald Belaney, and when it opened, no holds were barred. He came publicly associated with ud and scandal. People were more erested in his masquerade than his itings. The number of his wives was re important than his effort to fur r Canadian conservation. The pride d encouragement he gave to native oples and their traditions was set de for the sensationalism of his love "whooping-it-up". And when the blic was tired of the expose and eir own moralizations, he became as forgotten as yesterday's newspapers.

Yet, it is time which becomes the final judge of a person's accomplishments, and it is time that the words and thoughts of Grey Owl have survived. His books are regaining popularity and he may yet become recognized as one of Canada's greatest northern writers, as he was called before his death. One saner journalist wrote after Grey Owl's death, "He was not, they say, a real Red Indian. So what?"[18]

Regardless of what Grey Owl was not, today we may be certain of what he was. He was an exceptional author and naturalist. He was a perceptive man whose life style demanded that he cast his fortune to the wind — no matter what. He was a great Canadian. The sadness is that it has taken us so long to realize it.



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AGATE AND AGATIZED-WOOD BEARING GRAVELS OF SOUTH-CENTRAL SASKATCHEWAN

by PAUL BROUGHTON*

Most gem and mineral collectors are familiar with collecting localities in British Columbia, and indeed it is considered to be essentially the only focal point for western Canadian collecting. It is generally not well known, however, that the plains of southern Saskatchewan also have deposits of agate and agatized wood.

Southern Saskatchewan is characterized by a cover of Pleistocene till and gravel over Paleocene and upper Cretaceous sands, silts and clays, which are exposed in river valleys and badland areas. Where Ice Age deposits do not cap these bedrock sediments, an upper Tertiary gravel deposit frequently does. These Miocene and Oligocene age gravels are widely distributed over southcentral and southwestern Saskatchewan, often forming crests of hills and other higher elevation deposits. Such gravel deposits and gravel pits are ideal areas for prospecting for associated agates and agatized woods. During my several years of wandering the southern Saskatchewan countryside for notable agate accumulations, I have located what I consider to be amongst the best agate-bearing gravel deposits in this part of Prairie Canada.

It is the intention of this article to discuss recent finds of agate in the gravel pits around the town of Rockglen. I have located five good collecting areas in the Miocene-age Wood Mountain Formation, a sand and gravel accumulation associated with the southcentral portion of this province.

It is very difficult to give mileage directions from such and such a point to these deposits because of the confusing nature of the repetitious grid road system. Nevertheless, the locations are best described by the following legal section division designations to be used in conjunction with the available topographic maps of the area.

Locality	LSD**	Section	Township	Range	Meridian	Topographic Map
1	NW 6	32	2	30	W2	72 H/4
2	NE 16	23	1	2	W3	72 G/1
3	SW 8	12	1	1	W3	72 G/1
4	NE 7	7	1	30	W2	72 H/4
5	NE 9	33	1	29	W2	72 H/4

*Saskatchewan Dept. of Mineral Resources,
1914 Hamilton Street,
Regina, Saskatchewan.

**Legal subdivision

Vell agatized wood. Paul Broughton

All five of these localities are gravel its between Rockglen and the 'anada-United States border, a istance of about 12 miles.

For those rockhounds willing to hance the location of these gravel pits vithout the use of topographic maps, I ave mileage directions to each ocality in turn.

ocality 1: This gravel pit is probably he poorest locality of the five escribed here, but it is the most accessible. From the south end of Rockglen go 1 mile south, then 1.7 niles west on Highway 2. The gravel it is on the south shoulder of the road nd is visible from highway. The ravel pit is small and shallow, not nore than a hundred feet across and ess than ten feet deep. The gravel is ine, with clasts generally under an nch diameter. The agate clasts are infrequent, usually a monotonous buff rown and under 1/2 inch diameter. The wood is more frequently found ut not well agatized. Most of the eplacement mineralization appears to be a firable clayey material, not unlike the outer rinds of carbonized wood. Nevertheless, some very large stumps and trunks of this non-gem quality replacement material have been found in farmers' fields in the area.

Locality 2: This is the best of the gravel pits I have found during my field work. All the accompanying photographs were taken at this site, as well as the photographs of the recovered agates and woods. The locality is reached by going 1 mile south of Rockglen, 7 miles west on Highway 2, then 6 miles south, 4 west, 2 miles south and 1 mile east to deadend at the pit. The gravel pit is relatively small, about 150 feet wide, cut across the side of a small knoll. A 15-foot high sand and gravel bank is exposed. The gravel clasts are as much as 4 or 5 inches across and accumulate in extensive talus slopes. The agate is of a wide variety. Some of it is similar to Montana agates, the clear chalcedony with black interior patches of various abstract designs. Some of the agate is simple dark brown to buff, translucent and weakly banded, and other specimens are reasonably fine quality carnelian. Once, during an afternoon of collecting I found four 1- to 2-inch diameter agates that were highly translucent, almost transparent, flawless and an even honey yellow color. They impress me as being able to cut into cabochons similar to fine amber. This particular variety of agate I personally prize, but that's but a matter of taste. Dull deep reddish brown jasper clasts are prolific throughout the gravel, but they hold little interest for me. The wood sections are well agatized and usually retain the distinct concentric ring structures. The woods tend to be dark gray to reddish brown, not very colourful but solid and well agatized. Sometimes a long section is uncovered, a foot or more in diameter. When sliced open it is a beautiful assortment of gray, white, buff brown, and deep red swirls, patches and streak patterns. I have also found a fossil primitive horse tooth at this locality.

Locality 3: This locality is reached by taking the grid road south from Rockglen for 10 miles, then 3 miles west and a half mile south. A farm house is situated opposite the gravel pit, at which permission must be asked to collect. There is a wide variety agates and woods similar to Locality but the overall size is smaller, usuall around an inch in diameter, or less fo the agates. The woods are wel agatized but relatively hard to find.

Searching for agates in a gravel pit of the Wood Mountain gravels. Paul Broughton

Locality 4: This gravel pit is reached b travelling 10 miles south fron Rockglen, 2 miles west, then a hal mile south to bring you against th base of a steep gravel hillside. Park a the base and walk a quarter mile u the hillslope on the jeep trail to th gravel pit on the crest. The drive to th top is not recommended as there is n place to turn around. The pit is smal and essentially but a scraping off of th hilltop. Nevertheless, there is plenty well agatized wood here, but relativel little agate.

Locality 5: This large gravel pit i reached by taking the grid road sout from Rockglen for 6 miles, then miles east. The pit is visible from th road. I have not had very much succes at this locality, but friends report find of petrified logs ten to a hundre pounds or more in weight. It is not to bad for agate of rather monotonou color, though, and should be investigated more thoroughly.

The above are the best agate collecting localities that I know of in th part of southern Saskatchewan. prefer to hunt for agate and agatize wood in gravel pits, but fellow ger seekers equally appreciate wanderin across fields and hillsides hunting fo surface float. Many of my friends lik to walk the beaches of Fife Lake fo pieces of petrified wood exposed alon the shore. Many 40- or 50-pound sections have been recovered this way Fife Lake is 4 miles northeast Rockglen. I have never walked i shores because of recent high wate levels, but, someday I shall. The stor of that will be another day, anothe time.

FURTHER DISCOVERIES OF SAND VERBENA IN ALBERTA

by HOPE JOHNSON[1] and BERYL HALLWORTH[2]

An unusual plant, Sand Verbena *bronia micrantha* Torrey), was ollected by the first author in uthern Alberta in July, 1972. It was und in the South Saskatchewan iver valley about 15 miles north of edicine Hat at a spot known locally s the "Bull Pound" (Fig. 1). The site as an area of silty sand that had been leared in early 1971 to make a small mergency landing strip. Associated pecies were June Grass (*Koeleria ristata*), Blue Grama Grass (*Bouteloua racilis*), Sand Dropseed (*Sporobolus ryptandrus*), Lance-leaved Psoralea *Psoralea lanceolata*), Clammy-weed *Polanisia trachysperma*), Golden Aster *Chrysopsis villosa*) and Prairie Sunlower (*Helianthus petiolaris*).

The plant was first taken to be Sand ock (*Rumex venosus*) because of arge wings around its fruits but its rittle stems and annual roots uggested otherwise. Young plants ooked like those of the Goosefoot roup in the shape, colour and ealiness of the underside of their eaves.

Curiosity drove the collector to go orth a few miles where it was known hat Sand Dock was common along a andy road. Unfortunately, it was ound that some sort of disease, apparently a bacterial wilt or blight, had ffected the formerly flourishing colony, and it was possible to find only ne flowering stem, and that an immature one. However, examination of it showed that the two plants were quite different.

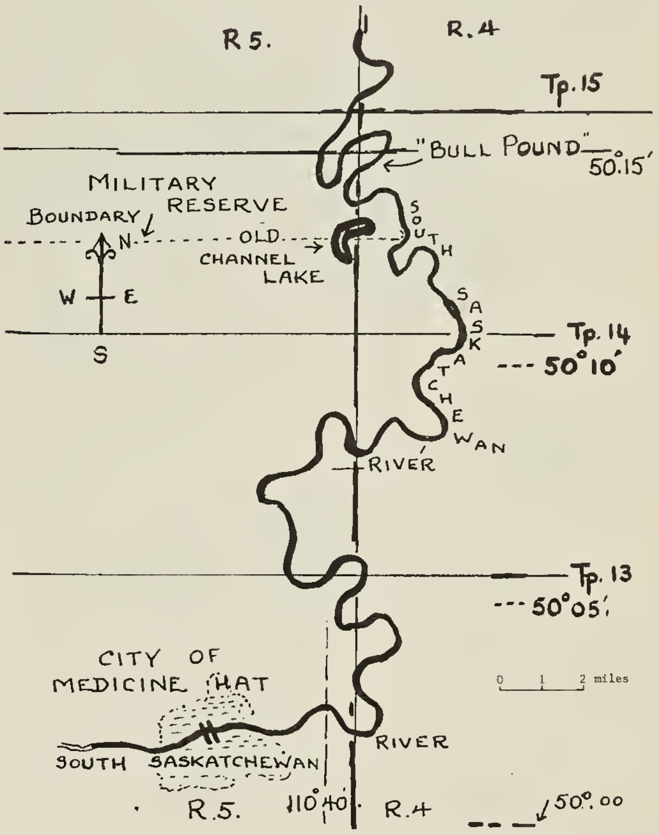


Fig. 1 "Bull Pound" area, South Saskatchewan River, 13 miles N. of Medicine Hat, Alberta.

The following winter the specimens and a drawing (Fig. 2) was examined and determined by the second author as Sand Verbena (*Abronia micrantha*). The only other known location of the plant in Alberta at that time was Manyberries (B. Boivin, 1967, "Flora of the Prairie Provinces, Part I.").

A return visit to the area in July, 1973, yielded no further plants at the former site but reason suggested that a search down-wind would be profitable and, indeed, numerous plants were

---

[1] Ralston, Alberta.

[2] Herbarium, Department of Biology, University of Calgary, Calgary, Alberta.

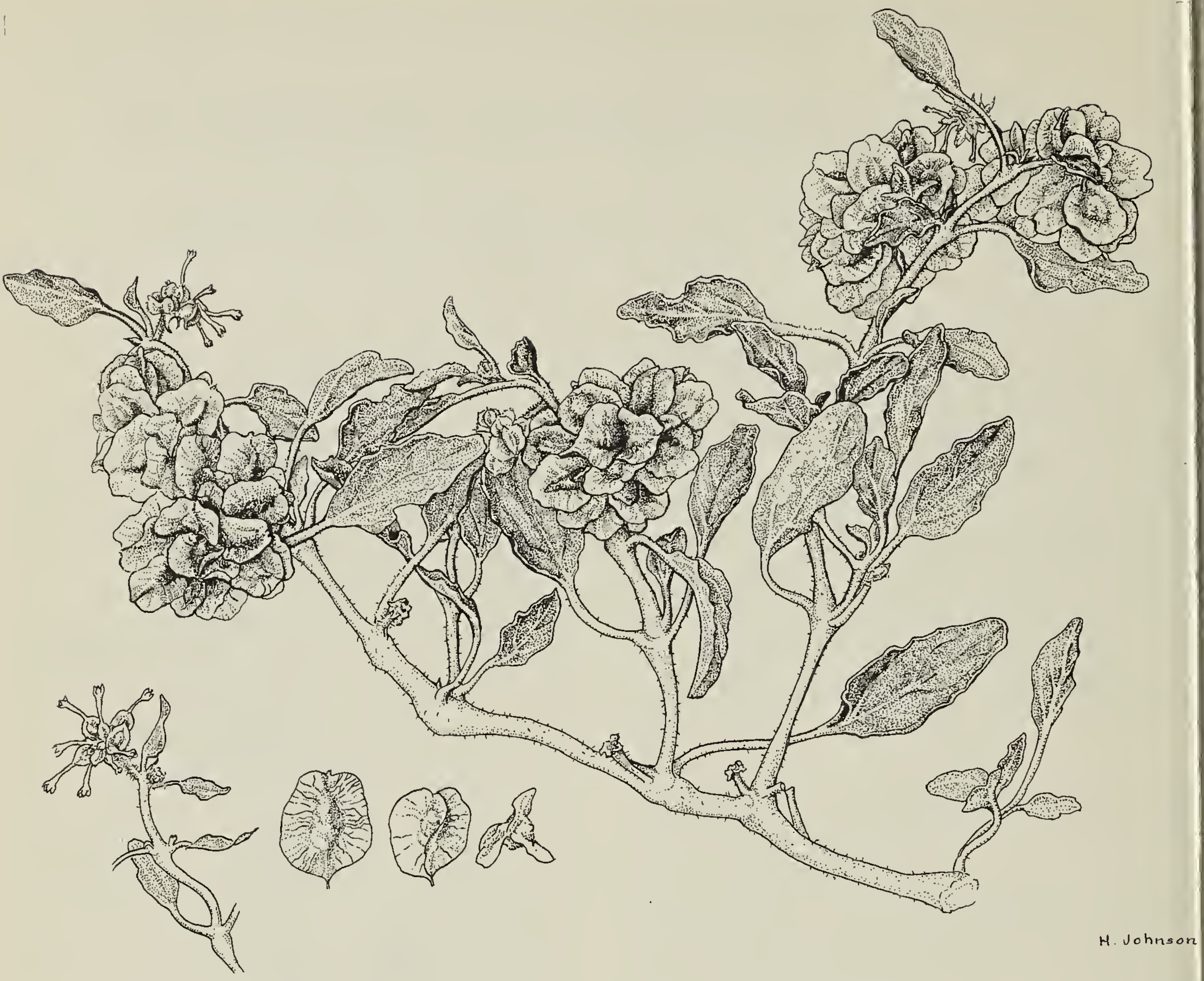
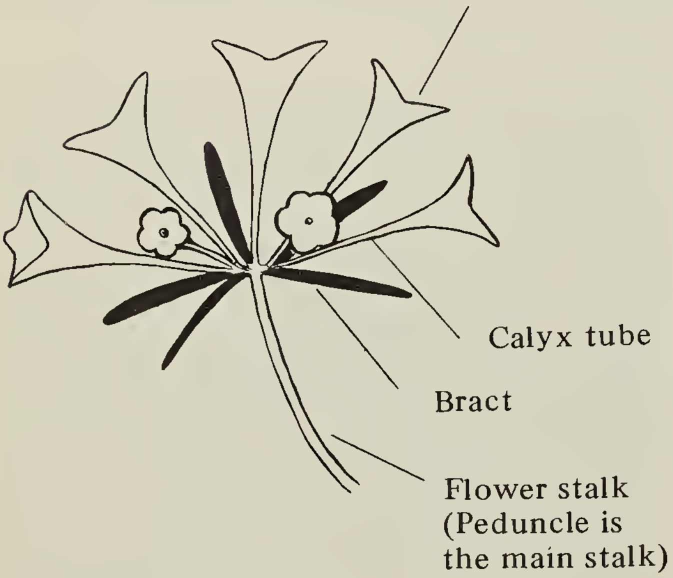


Fig. 2 *Abronia micrantha* Torrey.

Drawing by Hope Johnson



The flowers are sessile,
i.e. there are no pedicels.

Fig. 3 *Abronia micrantha* Torrey. Enlarged flower-head.

found about 100 yards to the north east.

An additional site was late discovered in the Lost River area near Manyberries, when the firs author recognized the plant on tw colour slides taken in the area by participant in an Opportunities fo Youth (OFY) project. Unfortunatel the exact location could not be determined.

Abronia (from "abros" — the Gree word for "delicate") *micrantha* (whic means "small-flowered") belongs t the Family Nyctaginaceae, called th "Four-o'clock Family" because th flowers tend to open in late afternoo A more familiar member of the famil in Alberta is Umbrellawort (*Mirabil hirsuta*), while a well-known tropica species is *Bougainvillea spectabili* Members of the genus *Abronia* are a tractive plants with bright pink to white, rather fragrant, flowers which are conspicuous in the spring in sandy places, especially in Arizona and California.

Abronia micrantha is an annual, up to 1 ft. high, with succulent, pale stems that are enlarged at the nodes. The paired leaves are petiolate, entire, lanceolate to ovate, farinose below, and have prominent veins. Sheathing stipules (ochrea) are absent but are present in the similar Sand Dock.

The tiny flowers are quite showy as they are arranged in dense "heads" with a ring of bracts underneath. The flowers themselves are very interesting as they lack petals but have a petalloid calyx in the form of a long tube which ends in 5 petal-like lobes (Fig. 3). The stamens lie inside this tube while the ovary is found at its base. A curious thing happens when the ovary becomes a fruit. The base of the calyx tube becomes transformed into a winged structure, closely enclosing the fruit and aiding in its dispersal. These winged fruits are characteristic and look quite attractive as they are pale green with a pink blush. (Fig. 2).

This species is of interest as it is usually associated with desert or semi-desert conditions. Sand Verbenas are "ephemerals", i.e., they cover the desert in the spring with a blaze of colour, then set seed and die. This is an adaptation to desert conditions, and a very successful one, as the plants survive the torrid heat of midsummer as dormant seeds. *Abronia micrantha* has been found growing on sand dunes and dry ground in the Mohave Desert, California, Arizona, Nevada, Colorado and Montana.

SOME BUTTERFLIES AND BIRDS AT HASBALA LAKE, SASKATCHEWAN

by RONALD R. HOOPER*

Hasbala Lake is Saskatchewan's northeasternmost lake. It sits astride the Saskatchewan-Manitoba border, and the north shore comes within 1/2 mile of the Northwest Territories. It is in the sub-arctic zone and is only about 75 miles from the barren grounds. On June 27, 1973, I began a 7-day field trip there for the Provincial Museum accompanied by a botanist, Bernard DeVries. We flew from La Ronge, stopping at Kinosao on Reindeer Lake to refuel enroute. We set up camp on a knoll near the southwest corner of the lake.

Much of the area on the west and south shores of the lake had been burned by a forest fire a few years previously. Outside of this burned area the predominant trees were black spruce. There were also sand blowout areas with jack pines. Birch grew along the eskers. Poplars and white spruce were scarce. The forest cover was, in

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most places, not dense with either trees or shrubs, and in some areas it was relatively open country — the tops of the eskers, the steeper hollows or kettles between the eskers, boulder areas along or near streams, and the sand blowouts. Outcrops of bedrock were rare.

The weather was hot and extremely dry. The lichens crunched like corn flakes under our feet. The blackflies were plentiful and ferocious in the daytime, and there were enough mosquitoes at night to keep things lively.

I did not find a great variety of insects, but some were of interest. Among the beetles collected were the Tiger Beetle (*Cicindela limbata hyperborea* Leconte) in the sand blowouts, and the Predaceous Diving Beetle (*Agabus tristis* Aube) in a creek. Some interesting moths were taken. The noctuid *Sympistis melaleuca* (Thun.) was plentiful on the top of eskers. The geometrid *Aspilates taylorae* (But.) was also taken. It resembles our prairie *Aspilates orciferaria* Wlk., but it lacks the median dark spot on the underside of the hindwing.

BUTTERFLIES

The following is an account of the 12 species of butterflies recorded:

GRIZZLED SKIPPER (*Pyrgus centaureae freija* Warren) — six specimens collected on July 3, and two on July 4, all in somewhat worn condition. They were found on wet moss along the edge of open bogs. It was the first time I had collected the species although it had previously been found at Wachee in the Pasquia Hills by John Masters.

PALAENO SULPHUR (*Colias palaeno chippewa* Edwards) — 16 specimens were collected in open forest areas. More than 50 percent of the females were albinistic. I have previously collected it in Saskatchewan only at Stony Rapids; Gary Anweiler collected one at Black Lake.

DORCAS COPPER (*Lycaena dorcas* Kirby) — this species was not seen on the wing when we first arrived but two freshly emerged males were taken on July 3 in open bogs.

YUKON BLUE (*Plebejus optilete yukona* Holland) — fairly common along the tops of eskers where there was an abundance of the Dry Ground Cranberry (*Vaccinium vitis-idaea* L.) on which the caterpillars probably feed.

ARCTIC BLUE (*Plebejus aquilo* Boisduval) — found among boulders along a stream and along the north slope of one of the bigger kettles. The specimens seem to be lighter underneath than *P. aquilo lacustris* Freeman and tend toward the arctic subspecies *P. a. aquilo*.

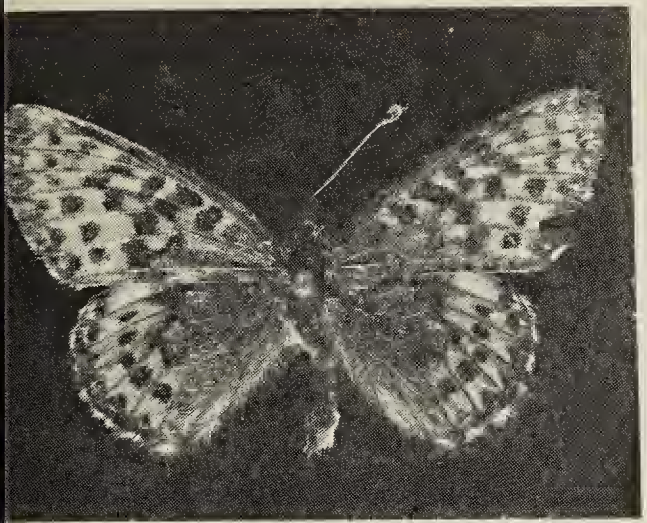
PAINTED LADY (*Vanessa cardui* Linnaeus) — a few tattered specimens were seen along the eskers and one was collected. It is interesting that this species, which migrated into southern Saskatchewan in large numbers in 1973, reached this far north.

SILVER BORDERED FRITILLARY (*Boloria selene* Schiffermueller) — found locally in grassy areas along the shores of lakes.

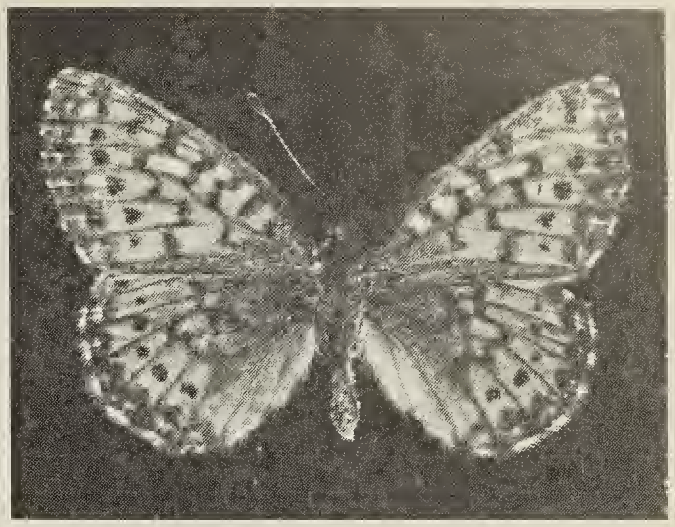
FRIGGA FRITILLARY (*Boloria frigga saga* Staudinger) — uncommonly seen. Sever specimens collected on June 27 and 28.

FREIJA FRITILLARY (*Boloria freija* Thunberg) — occasionally seen and collected. The specimens were quite worn, indicating that they had been on the wing for some time.

PURPLE LESSER FRITILLARY (*Boloria titania boisduvali* Duponchel) — this was the commonest butterfly. Fifty-three specimens were taken. It was the first time that this subspecies has been taken in the province Alexander Klots was kind enough to check the identification for me. This subspecies has been previously taken south to Churchill, Manitoba, and Fort Rae, Northwes Territories. At Hasbala Lake it was found scattered throughout the wooded areas. It was surprising to find it so early in the summer, because *Boloria titania grandis* Barnes and McDunnough of farther south does not emerge until mid-July. Perhaps it emerged early because of the hot, dry weather. It differs from *B. t. grandis* in the following points: (a) it averages a little smaller (30-36 mm wing spread); (b) the wings have a more extensive dark basal area on the upper side; (c) the darker areas on the underside of the hindwings are a lighter shade of brown; (d) the white and tawny areas on the underside of the hindwings are a little more clearly defined, and sometimes more extensive; and (e) on *B. t. grandis* the broad median band on the underside of the hindwing is undivided. On *B. t. boisduvali* this broad band is divided by an "X" on 1/4 of our specimens.



urple Lesser Fritillary.
ale, upperside.



Female, upperside.

OG FRITILLARY (*Boloria eunomia* Esper) — three specimens collected on June 27.

UTTA ARCTIC (*Oeneis jutta* Huebner) — ree specimens collected and a few others en in some of the thicker stands of black ruce.

BIRDS

Although no time was taken to search for rds, I recorded those that we heard or w. Those not listed in *The birds of rtheastern Saskatchewan* are marked with asterisk.[1]

OMMON LOON. Seen twice. One pair rthwest of camp on a small lake on June 9; one calling on Hasbala Lake, June 30. **ED-NECKED GREBE.** One on a pond rthwest of camp on June 29. **GULLS**. nidentified white-headed gulls were seen ery day. **COMMON GOLDENEYE**. One ick seen on June 30 at a distance may ve been this species. One pair was sitively identified on July 2. We saw surisingly few ducks. **SCAUP.** A pair on a nd about 4 miles south of Hasbala Lake peared to be so large that they must have en Greater Scaup. I did not see them in ight. **GOSHAWK**. One south of camp on ly 2. **SPRUCE GROUSE**. One on June , south of camp. **WILLOW PTARMIGAN**. eathers found on June 29. **COMMON NIPE**. One winnowing over camp in the enings. **SPOTTED SANDPIPER**. One was en on June 30. **SOLITARY SANDPIPER**. ne in marsh northwest of camp on June 9. **LESSER YELLOWLEGS**. Two pair olding us on June 29. **SHORT-EARED WL**. One on June 28 near our camp. **OMMON (YELLOW-SHAFTED) LICKER**. One northeast of camp on June 9. **YELLOW-BELLIED FLYCATCHER.** alling near camp, June 28 and 29. **OLIVE-SIDED FLYCATCHER**. One near our camp on July 2. **TREE SWALLOW**. Two near camp on July 2. **GRAY JAY**. One south of camp on June 28. **COMMON RAVEN**. One on June 30. **BOREAL CHICKADEE**. A flock on June 30. **AMERICAN ROBIN**. One on June 30. **HERMIT THRUSH**. One heard singing in evening south of camp on June 27. ***VEERY**. One heard on June 30. **YELLOW-RUMPED (MYRTLE) WARBLER.** Two pair on July 2. **BOHEMIAN WAXWING**. One flew over camp on July 2. ***WINTER WREN**. A wren seen near our camp on June 30 was probably this species. The song was a little like that of a House Wren but longer and more musical. ***BROWN THRASHER**. One seen and heard singing near camp on July 2. **RUSTY BLACKBIRD**. One seen northwest of camp on June 29. **PINE GROSBEAK**. One scolding female south of camp, June 28. **REDPOLL**. Two flocks flew over camp on July 2. They were flying too high to distinguish the species. **DARK-EYED (SLATE-COLORED) JUNCO**. One bob-tailed young seen, June 27; 1 adult on June 28. **TREE SPARROW**. One heard singing on June 27 and 28. **HARRIS' SPARROW**. Two seen June 28 perching on dry trees and stumps on the burn. **WHITE-CROWNED SPARROW**. Saw one pair and their nest of well feathered young south of camp on July 2. **WHITE-THROATED SPARROW**. Heard on July 2. **FOX SPARROW**. One seen on June 30. **SONG SPARROW**. One seen and heard on July 2. July 2.

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[1] NERO, R. W. 1967. *The birds of northeastern Saskatchewan*. Spec. Pub. 6, Saskatchewan Nat. Hist. Soc. Regina. 96 p.

SASKATCHEWAN DAMSELFLIES AND DRAGONFLIES

by DENNIS M. LEHMKUHL*

This article, the first of a planned series on insects, is based on drawings by Arthur R. Brooks. In 1962 at the early age of 45, Art Brooks died. A highly energetic researcher at the Canada Department of Agriculture Research Station in Saskatoon, he left behind, in various stages of completion, a number of taxonomic drawings and manuscripts. In 1970 I obtained custody of the material and it sat in the Biology Department until several months ago when I discussed with Dr. Gollop, *Blue Jay* Editor, the possibility of a series of articles which would use Brooks' drawings as a nucleus. He enthusiastically agreed, and I thank him for allowing this opportunity for the drawings to be more widely appreciated. I also thank John Waddington, Biology Department photographer, for using his skills in producing the finished plates. John Waddington took the photographs of the pinned specimens; the one of the ovipositing damselfly is by the author. This article is dedicated to Arthur R. Brooks and is presented as part of a program of the Entomological Society of Canada and Entomological Society of Saskatchewan's Student Encouragement Committees.

Damselflies and dragonflies (Odonata), along with butterflies, moths and beetles, have long been the delight of entomological collectors. Unfortunately, while the latter groups retain their attractive colouration in the preserved state, the brilliant reds, blues and greens of damselflies and dragonflies usually fade to blacks and greys after death. Thus odonates in collections, while perhaps impressive in comparison to some other groups of insects, are but a reminder of the glory of living specimens in their natural habitat. (To save space, the name of the order, Odonata is often anglicized to "odonates" and used for "damselflies and dragonflies".)

While collections may fade, naturalists seeking new horizons would do well to turn to the study of damselflies and dragonflies because of the interesting and complex behaviour of the group, including territorial defense, aggression, migration and elaborate displays during courtship. Like birds, these animals are larg
enough that they can be identified i
the field (after you have done you
homework on preserved specimens
and the history of individuals o
groups can be followed by marking th
wings with small dots of paint i
various colour combinations. To mak
it more interesting, the group is poorl
enough known that anyone who studie
them, especially in the Prairie Provinces, is likely to turn up new facts an
records that can contribute to the fun
of scientific knowledge.

Everyone at one time or anothe
crosses paths with the adult Odonates
On warm summer afternoons dragonflies invade suburban backyards i
search of one of their main foods, th
mosquito. Large blue and blac
darners (Aeschnidae) with wing span
of up to 4 inches hover roads in th
green tunnels of the boreal fores
sometimes ending up as a large smea
on the windshield of a speedin
vehicle.

Damselflies, the more refined members of the order, usually are foun
delicately fluttering among the grass

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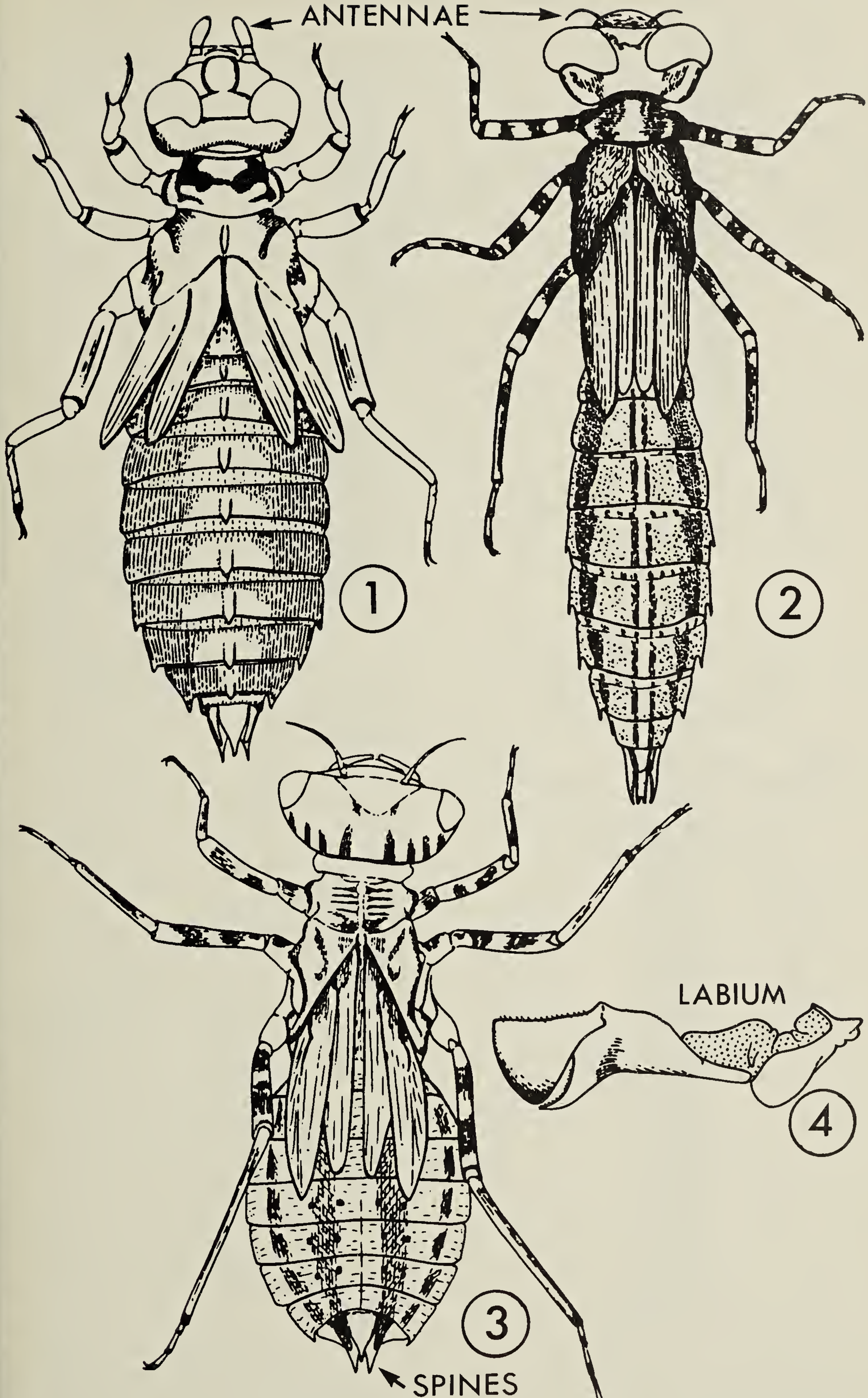


. 1-4. Nymphs of Dragonflies. 1. Clubtails; 2. Darners; 3. Common Skimmers; 4. Side iew of labium of Common Skimmers (compare with Fig. 7 for orientation).

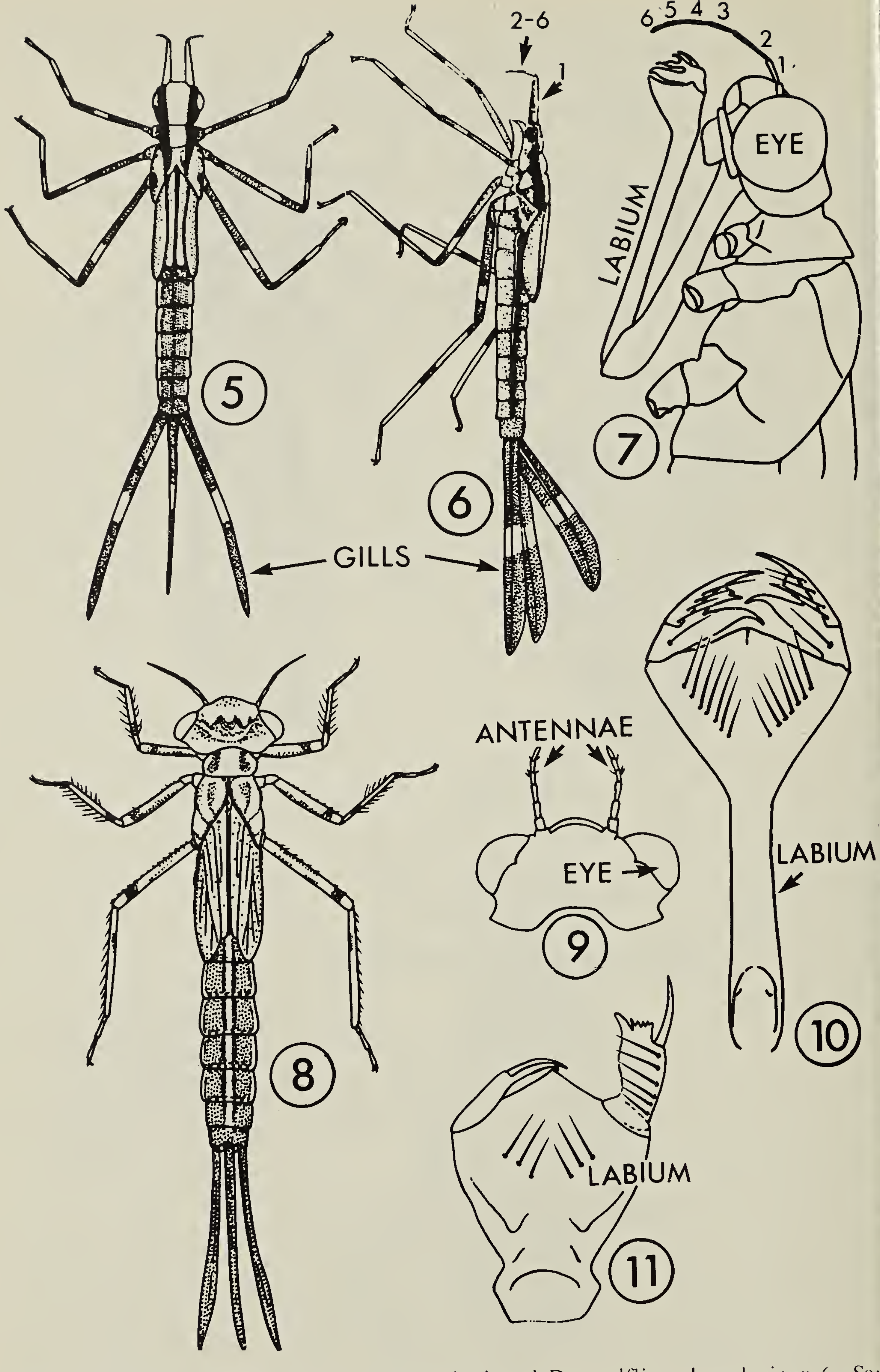


Fig. 5-11. Nymphs of Damselflies. 5. Broad-winged Damselflies, dorsal view; 6. Sam side view; 7. Generalized odonate head and thorax, side view, showing especially th elbowed labium; 8. Body shape found in Spread-winged and Narrow-winged Dam selflies; 9. Antennae of these families with segments of even length; 10. Labium o Spread-winged Damselflies, extended and in dorsal view; 11. Same, Narrow-winge Damselflies.

d reeds on shores of lakes and ponds all descriptions — also in search of osquitoes and other insects. In early tumn, bright red Common Skimmers ibellulidae) patrol sidewalks of ict parks and campuses. They may this because light reflected from ment resembles that reflected from ater, thus confusing these basically uatic insects, or because parks and mpuses are just good hunting ounds. There are a number of obser- tions of these insects attempting to y eggs on a shiny car roof instead of water.

The immatures are less often seen. lonates have three stages to the life cle: the egg (Fig. 15), nymph (or iad or larva — take your choice; gs. 1-3 and 5, 6, 8) and adult (Figs. , 21, 22). Nymphs live in water and e species or another can be found in most any unpolluted natural aquatic bitat. Clubtails (Gomphidae, Fig. 1) e abundant in the Saskatchewan iver; scorpion-like, Broad-winged amselflies (Agriidae; Figs. 5 and 6) efer streams at the edge of the boreal rest; ponds in prairies and parklands ound with nymphs of Common kimmers (Libelullidae; Fig. 3), read-winged Damselflies (Lestidae), d Narrow-winged Damselflies oenagrionidae; Figs. 8, 10 and 11). ll are voracious predators and feed anything that moves within reach of eir remarkable mouthparts, of which e labium ends in a set of spiked jaws d can be extended or withdrawn by eans of an elbow-like articulation igs. 4, 7, 10, 11). Once the prey is ptured by the labial jaws, the victim drawn to the mandibles where it is ewed up and devoured.

Mating in Odonata is accompanied some strange behaviour and the usual method of sperm transfer ac- unts for several peculiarities of lonate morphology. The opening of e male repoductive system is at the end of the abdomen (9th segment, Fig. 17), as is normal in insects, but once a sperm capsule is produced it is transferred to secondary genetalia on the second abdominal segment, just behind the legs (Fig. 17). Once a female is located and wooed, she is grasped behind the head with the male's clasper (Fig. 12; clasper, Fig. 17); the female then brings the tip of her abdomen forward and picks up the sperm packet from the second segment of the male. This process often takes place in flight while odonates are flying "in tandem". Sometimes the male continues to hold the female while she is depositing eggs (Fig. 16). Details of reproductive behaviour vary among species and much remains to be discovered concerning the Saskatchewan species.

Eggs usually are laid below the water surface (Figs. 13, 19), often inserted into plant tissues by means of the bladelike female ovipositor.

Whether one's main interest is ecology, behaviour or taxonomy, for positive identification of what you are looking at, it is necessary to make a collection of odonates. Immature stages are best preserved in 70 or 80% ethyl alcohol (rubbing alcohol will also work). Adults can be preserved in alcohol but the colour pattern will be lost and so they are usually kept dried. Those who have extensive collections, perhaps numbering in the hundreds or thousands of specimens, find the most economical way to keep their collection is in clear cellophane packets (such as are used for coins); these can be loosely stored in a filing cabinet (Fig. 20). For smaller collections, specimens may be pinned in the normal way, either lying on the side as in the broad-winged damselfly (Agriidae, Fig. 21) or with the wings spread as in the Common Skimmers (Libellulidae, Fig. 22). Pinned specimens are kept in boxes with cork, cardboard or

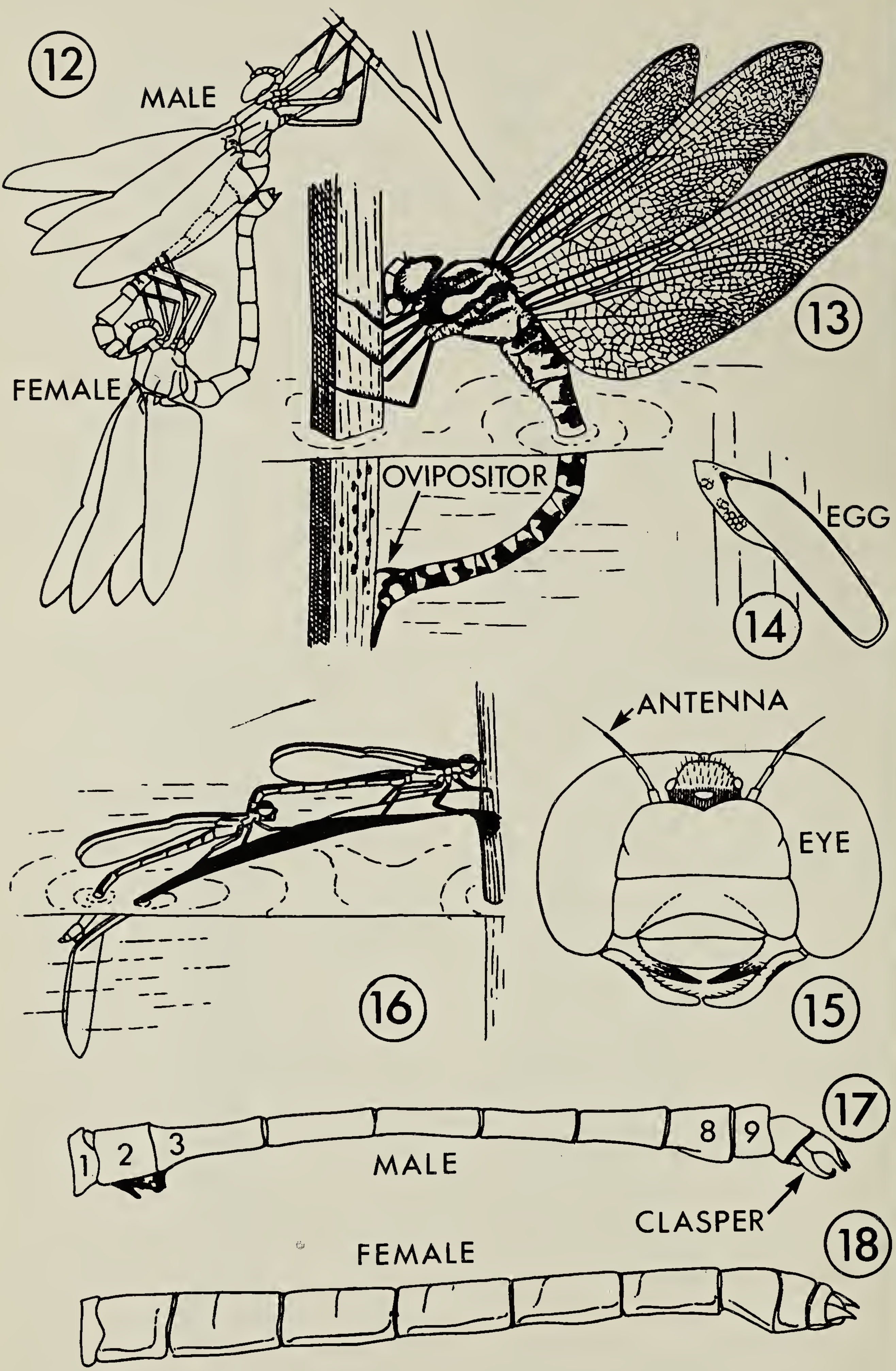
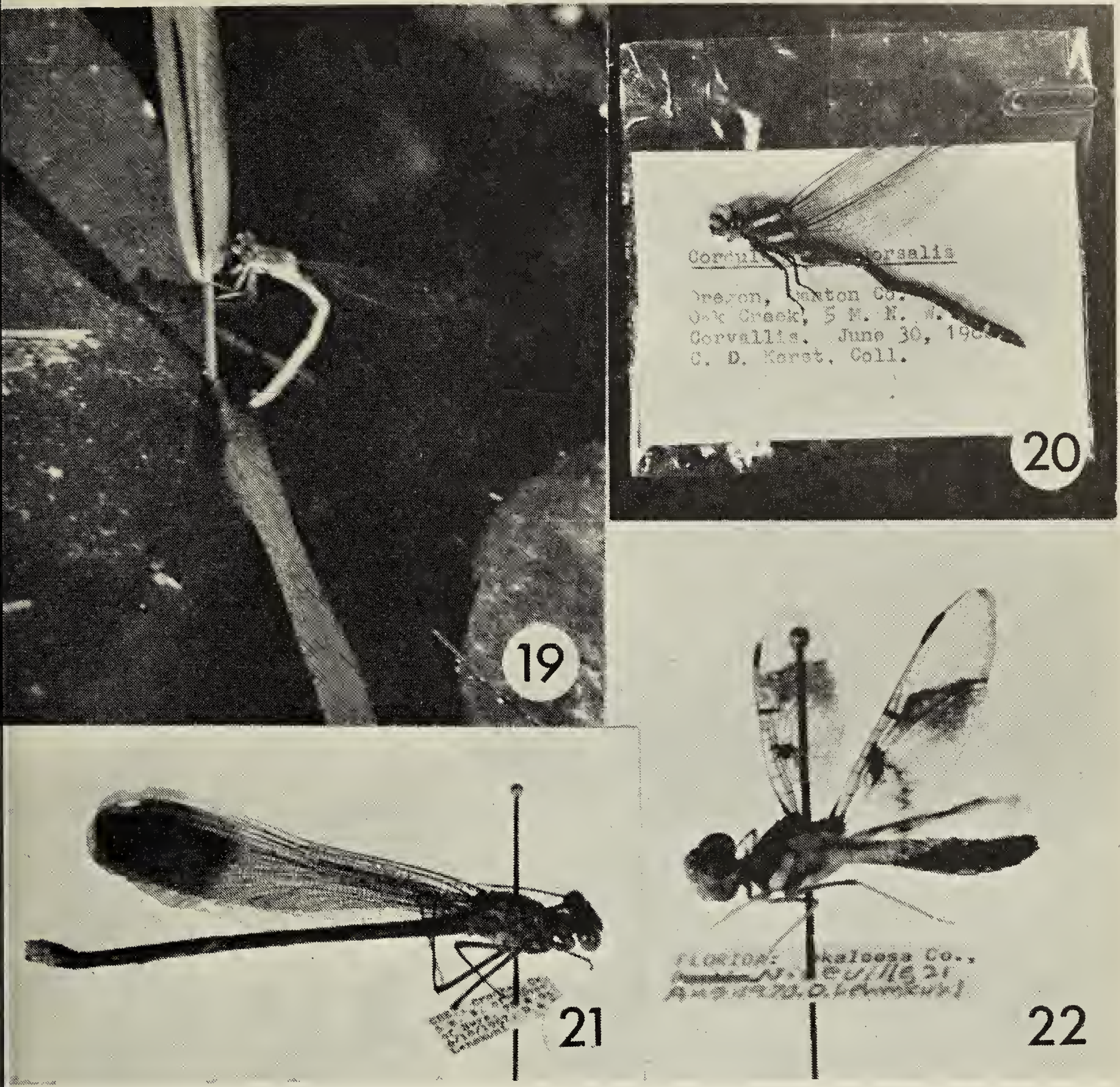


Fig. 12-18. Adult Odonata, behaviour and structure. 12. Mating dragonfli 13. Dragonfly laying eggs; 14. Egg implanted in plant tissue; 15. Face of dragonf showing eyes which meet on top of head; 16. Damselflies "in tandem", fema depositing eggs on leaf; 17. Abdomen of an adult male odonate; 18. Same, female.



ig. 19-22. 19. Female damselfly depositing eggs on a stem; 20. Adult dragonfly mounted in a cellophane envelope; 21. Damselfly (Agriidae) pinned and labelled, specimen lying on side; 22. Dragonfly (Libellulidae) pinned with wings spread.

yrafoam bottoms for supporting the in. Add a sprinkle of moth ball rystals to keep away dermestid eetles — which love to eat insect llections and can reduce prized ecimens to a pile of dust in a few eeks. It is very important that every ecimen be accompanied by the stan-ard data — locality, date and name of llector (Figs. 20-22). Materials for inning and collecting can be obtained om biological supply houses or often t a university bookstore.

While Edmund Walker (now eceased), the most prolific student of Canadian Odonata, concluded that Saskatchewan has a "poor" odonate fauna, it is still possible to find nearly 50 species in the province, about 30 of which are dragonflies and the remainder are damselflies (Table 1). By way of contrast, Walker lists 147 species from Ontario and 69 from Manitoba.

There are no good guidebooks to the *species* of Odonata of western Canada but anyone who is persistent and has a 10X hand lens should be able to identify to species any odonates collected in our area by referring to the volumes by Walker (1955, 1958), Needham and

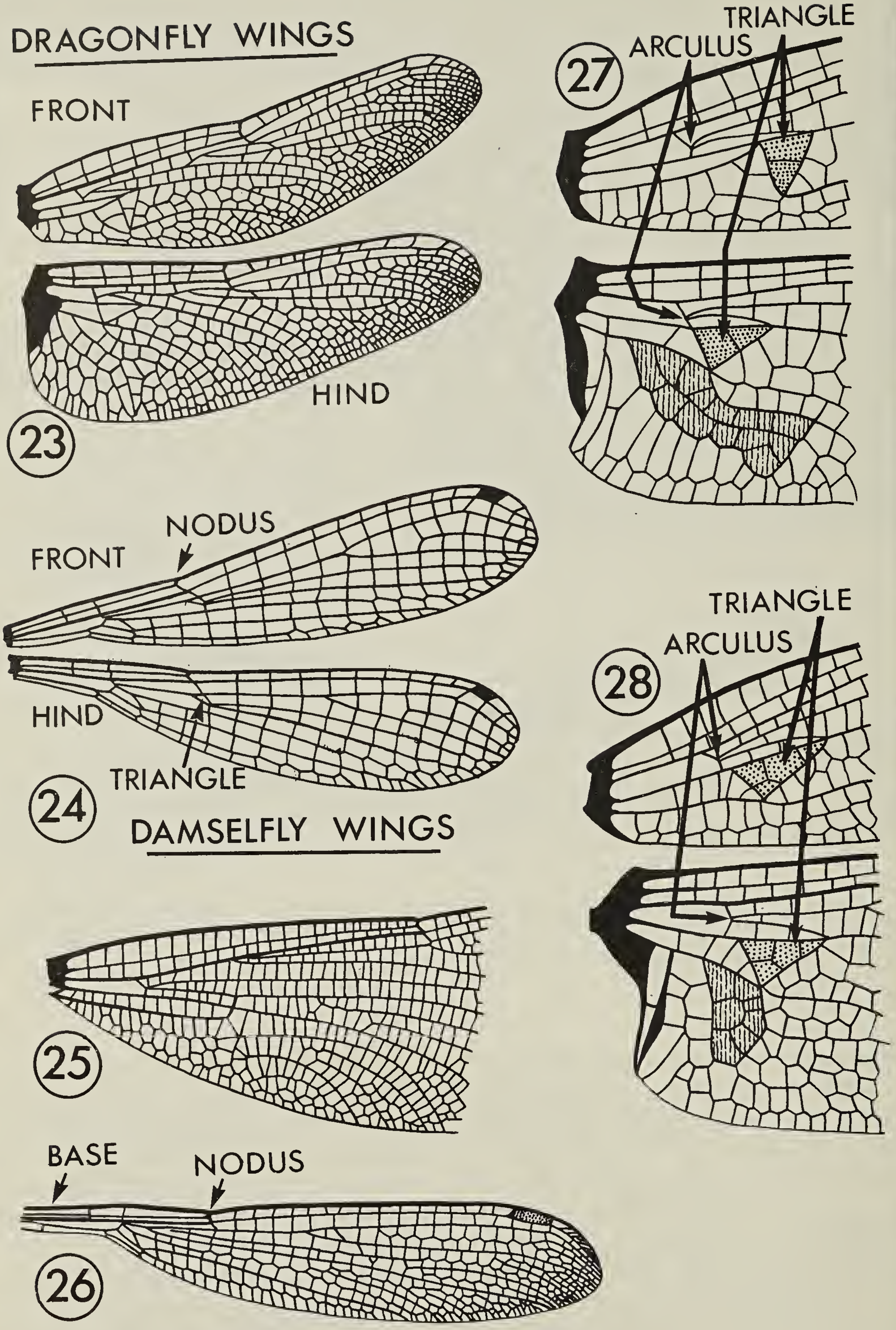


Fig. 23-28. Structures of adults for use with key to families. 23. Wings of dragonfl showing lobe at base of hind wing which is absent on front wing; 24. Wings of damselfl (Narrow-winged) showing similar shape of front and hind wings; 25. Wing base of Broad-winged Damselfly; 26. Wing of a Spread-winged Damselfly; 27. Wing bases of Common Skimmer; 28. Position of triangles in wings of Darners and Clubtails.

Westfall (1955) or Borer and White (1970). (Walker does not cover the Common Skimmers but these are inluded in Needham and Westfall). The following keys should facilitate he identification of specimens to amily. To use this or any other key, ead 1a and then 1b, select the true tatement, follow the dotted line to the next choice and once again determine whether a or b is appropriate for your specimen; follow the dotted line, and so on until a name is reached.

Anyone who catches a specimen far from the range indicated in Table 1 is asked to send it to the author for confirmation. It will then be added to the University collection.

Phylum Arthropoda, Class Insecta, Order Odonata

ADULTS

Key to Suborders

1a. Front and hind wings similar in shape at the base
(Figs. 24, 25, 26) .... **Damselflies** *(Zygoptera)* 2
1b. Front and hind wings dissimilar in shape at the base
(Figs. 23, 27, 28) .... **Dragonflies** *(Anisoptera)* 4

Key to Saskatchewan Families of Damselflies (Zygoptera)

2a. Wings narrow at the base but suddenly become wider (petiolate)
(Figs. 24, 26) 3
2b. Wings rounded evenly at the base (not petiolate)
(Fig. 25) .... **Broad-winged Damselflies** (*Agriidae* or *Agrionidae*)
3a. A small triangle in mid wing behind the nodus
(Fig. 24) .... **Narrow-winged Damselflies** *(Coenagrionidae)*
3b. No small triangle in mid wing behind nodus
(Fig. 26) .... **Spread-winged Damselflies** *(Lestidae)*

Key to Saskatchewan Families of Dragonflies (Anisoptera)

4a. Triangle (T) of fore and hind wings about equally
distant from arculus and similarly shaped
(Fig. 28) .... **Common Skimmers** *(Libellulidae)*
4b. Triangle more distant from arculus in fore wing than
hind wing (Fig. 27) 5
5a. Eyes meet or nearly meet at top of head
(Fig. 15) .... **Darners** *(Aeshnidae)*
5b. Eyes widely separated at top of head .... **Clubtails** *(Gomphidae)*

NYMPHS

Keys to Suborders

1a. Abdomen terminates in sharp spines
(Figs. 1-3) .... **Dragonflies** *(Anisoptera)* 4
1b. Abdomen terminates in 3 flat pointed platelike gills
(Figs. 5, 6, 8) .... **Damselflies** *(Zygoptera)* 2

Key to Saskatchewan Families of Damselflies (Zygoptera)

2a. Individual segments of antenna about equal in length
(Figs. 7, 9) 3
2b. First segment of antenna as long as following

6 segments combined
(Figs. 5, 6) .... **Broad-winged Damselflies** *(Agriidae* or *Agrionidae)*

3a. Basal part of labium (Fig. 7) narrowed like a
stalk when viewed from below.
(Fig. 10) .... **Spread-winged Damselflies** *(Lestidae)*

3b. Basal part of labium (Fig. 7) not narrowed like
a stalk but as in Fig. 11 . **Narrow-winged Damselflies** *(Coenagrionidae)*

Key to Saskatchewan Families of Dragonflies (Anisoptera)

4a. Antennae with 4 segments, segment 3 greatly enlarged and the
last segment minute (Fig. 1) .... **Clubtails** *(Gomphidae)*

4b. Antenna threadlike and with 6 or 7 segments
(Figs. 2, 3) 5

5a. Labium flat or nearly so in side view as
in Figure 7 .... **Darners** *(Aeshnidae)*

5b. Labium spoon shaped as in Figure 4 and covering
the front of the face up to the base of
the antennae .... **Common Skimmers** *(Libelullidae)*

Table 1. A preliminary list of the Odonata of Saskatchewan, from Walker (1940). Nomenclature follows Walker (1953)

Zygoptera	**Known Distribution**
Family Agriidae or Agrionidae	
1. *Agrion aequabile* (Say)	Prince Albert Park
Family Lestidae	
2. *Lestes congener* Hagen	P.A. to Jackfish Lake
3. *Lestes unguiculatus* Hagen	Regina-Maple Cr.-P.A.
4. *Lestes dryas* Kirby	Regina-Maple Cr.-P.A.
5. *Lestes disjunctus* Selys	Regina-Swift Current-P.A.
6. *Lestes forcipatus* Rambur	Prince Albert Park
Family Coenagriidae or Coenagrionidae	
7. *Enallagma clausum* Morse	Big Manitou-Lac La Ronge
8. *Enallagma boreale* Selys	Regina-Maple Cr.-P.A.
9. *Enallagma cyathigerum* (Charpentier)	Regina-Maple Cr.-Pa.
10. *Enallagma hageni* (Walsh)	Regina-Maple Creek
11. *Enallagma ebrium* (Hagen)	Regina-Maple Cr.-P.A. Park
12. *Enallagma carunculatum* Morse	Echo, Last Mt. Lakes
13. *Enallagma civile* (Hagen)	Regina-Swift Current
14. *Coenagrion resolutum* (Hagen)	Regina-Prince Albert
15. *Coenagrion interrogatum* (Hagen)	Muskegs
16. *Coenagrion angulatum* Walker	Regina-Swift Current-P.A.
17. *Nehalennia irene* (Hagen)	Rosetown-Prince Albert
18. *Amphiagrion abbreviatum* (Selys)	Maple Creek-Cypress Hills
Anisoptera (Dragonflies)	
Family Aeshnidae	
19. *Aeshna eremita* Scudder	Prince Albert-La Ronge
20. *Aeshna interrupta* Walker	Regina-Maple Cr.-La Ronge
21. *Aeshna canadensis* Walker	Prince Albert
22. *Aeshna sitchensis* Hagen	P.A.-P.A. Park
23. *Aeshna umbrosa* Walker	Maple Cr.-P.A.-Reindeer L.
24. *Aeshna constricta* Say	Diefenbaker Lake area (Snipe Lake)
25. *Anax junius* Drury	Regina, Southern Sask.

Family Gomphidae

26. *Ophiogomphus severus*	N. Sask. River at P.A.
Ophiogomphus colubrinus	Reindeer Lake region (Walker 1958)
27. *Ophiogomphus rupinsulensis* (Walsh)	S. Sask. River at Saskatoon
28. *Gomphus intricatus* Hagen	Sask. River., P.A. & Saskatoon

Family Libellulidae

29. *Cordulia shurtleffi* Scudder	P.A., P.A. Park
30. *Somatochlora minor* Calvert	Prince Albert
31. *Somatochlora ensigera* Martin	Maple Creek
32. *Somatochlora franklini* (Selys)	Saskatoon-P.A. Park
33. *Somatochlora whitehousei* Walker	Prince Albert
34. *Tetragoneuria spinigera* Selys	P.A. Park
35. *Libellula quadrimaculata* L.	Regina-Maple Cr.-P.A.
36. *Libellula exusta julia* Uhler	P.A. Park (species not listed in Needham, Westphall, 1955)
37. *Sympetrum corruptum* (Hagen)	Swift Current-Maple Cr.-P.A. (not in Needham, Westphall 1955)
38. *Sympetrum madidum* (Hagen)	Regina-Maple Cr.-P.A.
39. *Sympetrum obstrusum*	Lac Vert-P.A. Park
40. *Sympetrum decisum* (= *internum* Montgomery)	Regina-Maple Cr.-P.A.
41. *Sympetrum costiferum* (Hagen)	Swift Current-Prince Albert
42. *Sympetrum danae* (Sulzer)	Yorkton-Saskatoon-P.A.
43. *Leucorrhinia hudsonica* (Selys)	Lac Vert-P.A. Park
44. *Leucorrhinia borealis* Hagen	Indian Head-P.A. Park
45. *Leucorrhinia glacialis* Hagen	Prince Albert Park
46. *Leucorrhinia proxima* Calvert	Prince Albert Park
47. *Leucorrhinia intacta* Hagen	Prince Albert (City)

Further reading:

BORER, D. J. and R. E. WHITE. 1970. *A field guide to the insects of America north of Mexico.* Houghton Miffin, Boston, 404 p.

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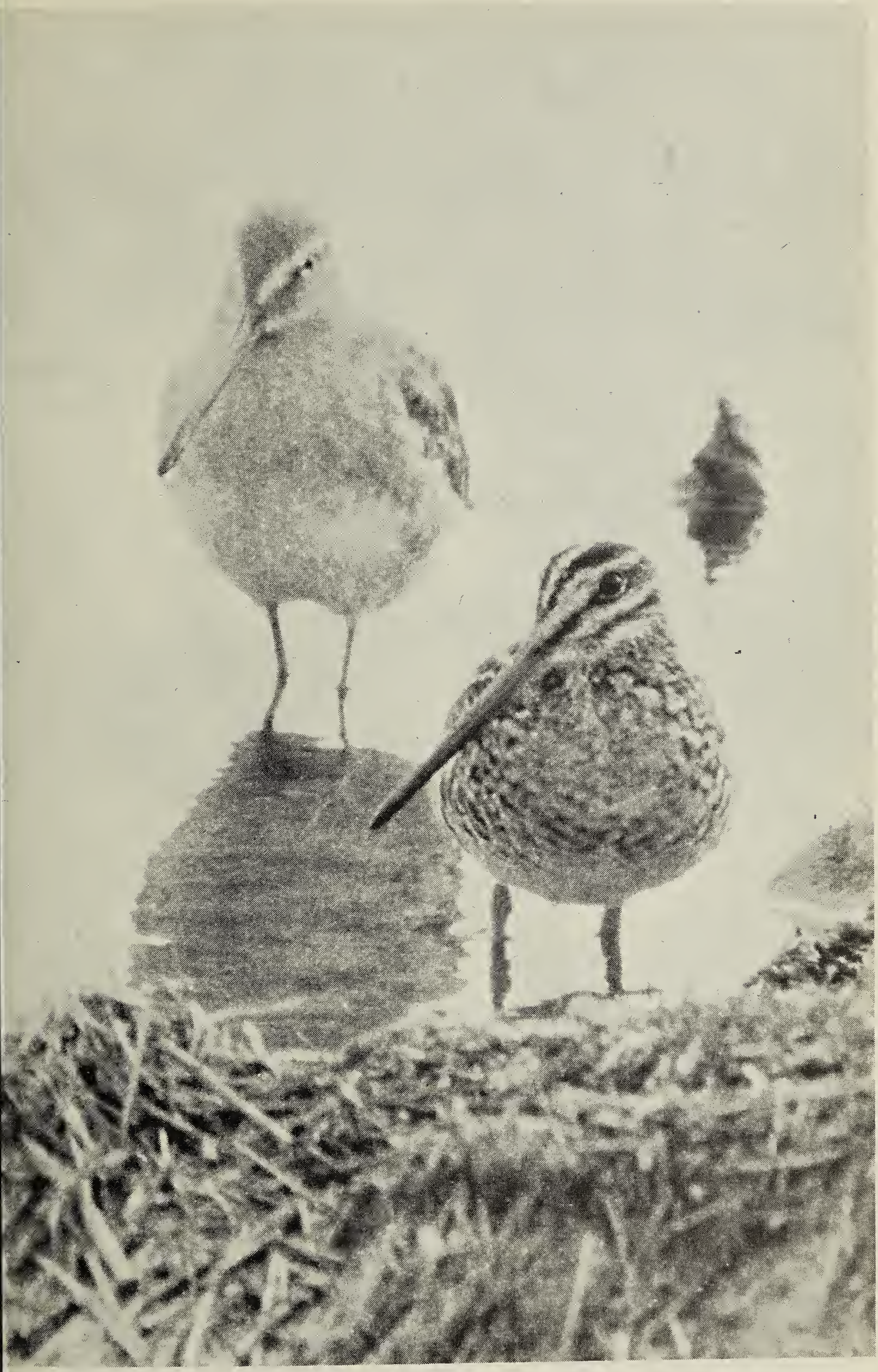
Pectoral Sandpiper and reflection.

Ken Lumbis



Common Snipe (foreground) and Long-billed Dowitcher (background). Ken Lumbis

33rd ANNUAL SASKATCHEWAN CHRISTMAS BIRD COUNT, 1974

Compiled by MARY I. HOUSTON*

The exceptionally mild winter weather up to and including the Christmas Count period is perhaps responsible for the large numbers of species of waterfowl recorded. Six species of birds were added this year to the all time list, five of these being waterfowl — Snow Goose and Greater Scaup being reported from Regina; White-fronted Goose and Green-winged Teal (previously on the additional list) from Saskatoon; and White-winged Scoter from Cold River. The other new species was a White-crowned Sparrow from Saskatoon. This brings the all-time total to 122 species seen on Count days since counts began in 1942 and an additional 6 species seen during the count period, but not on count days.

The unusual weather brought out more counters for longer periods of time and provided a more thorough coverage of the areas, which helps to account for the record high number of species seen in any 1 year: 79 species plus 4 additionals.

Many comments were made, however, about the lack in numbers of birds, particularly the winter birds such as Snow Buntings, Bohemian Waxwings and Pine Grosbeaks.

Most interesting was the number of localities reporting Golden-crowned Kinglets (13 including one locality where birds were seen as additional). This species has been recorded in only 11 of the past 33 years and never as widely spread or in such large numbers.

Gray Partridge, reported from only 14 localities, represented the major decrease.

Counters from 44 localities (see map) participated in Bird Counts this year.

The map was prepared by Wayne Harris.

1. BANGOR. Dec. 29; around yard and farm; 8 species, 26 individuals. — Mrs. A. Thompson.

2. BATTLEFORD. Dec. 26.; 3 miles on foot in 2 hours and 73 miles by car in 4 hours, temp. 32°, calm, 3 inches of snow; 13 species, 479 individuals. — S. G. Sealy.

3. BESNARD LAKE (55° 20'N 106° 00'W). Dec. 27; 25 miles on foot, 18 on skis, 14 on snowshoes, 10 by car, in 25-1/2 party hours, temp. 16°-30°, no wind, sunny in A.M. clouding over in P.M., 4 in. snow; 12 species, 339 individuals. (Add: Black-billed Magpie, 1, Dec. 26; Northern Shrike, 1, Dec. 26). — Betty, John, Jon (compiler), Naomi, Nikki, Pauline and Peter Gerrard.

4. BIGGAR. Dec. 23; 75 miles by car in 6-1/2 hours, 6 miles on foot in 6 hours, temp. 13°, wind 0-4 mph, overcast in A.M., clear in P.M., about 1 inch of snow; 14 species, 1033 individuals. (Add: Rough-legged Hawk, 1, Dec. 15, 20, 25, 27 and Jan. 1; American Merlin, 1, Dec. 15, 20, Jan. 2; Northern Shrike, 1, Dec. 25). — Don Renaud, Wayne Renaud, Alan Smith, Guy Wapple (compiler), Rodney Wapple.

5. BIG GULLY CREEK (15 miles NE of Maidstone). Dec. 19; 15 miles by car in 1 hour and 10 miles on foot in 5 hours, temp. 0°-15°, cloudy in A.M., clear in P.M., wind N 0-5 mph, 1/2 inch of snow; 15 species, 99 individuals. — Wayne Harris, Sheila Lamont.

6. BIRD'S POINT (on Round Lake, 7 miles S and 3 miles W of Stockholm). Dec. 29; at yard feeder; 7 species, 44 individuals. — Doug Francis.

7. BORDEN. Dec. 28; 2 miles on foot in 2 hours and 92 miles by car in 6-1/2 hours, temp. 11°-24°, wind W 7-11 mph, 2 inches of snow; 10 species, 764 individuals. — Mark Abley, John Shadick, Stan Shadick (compiler).

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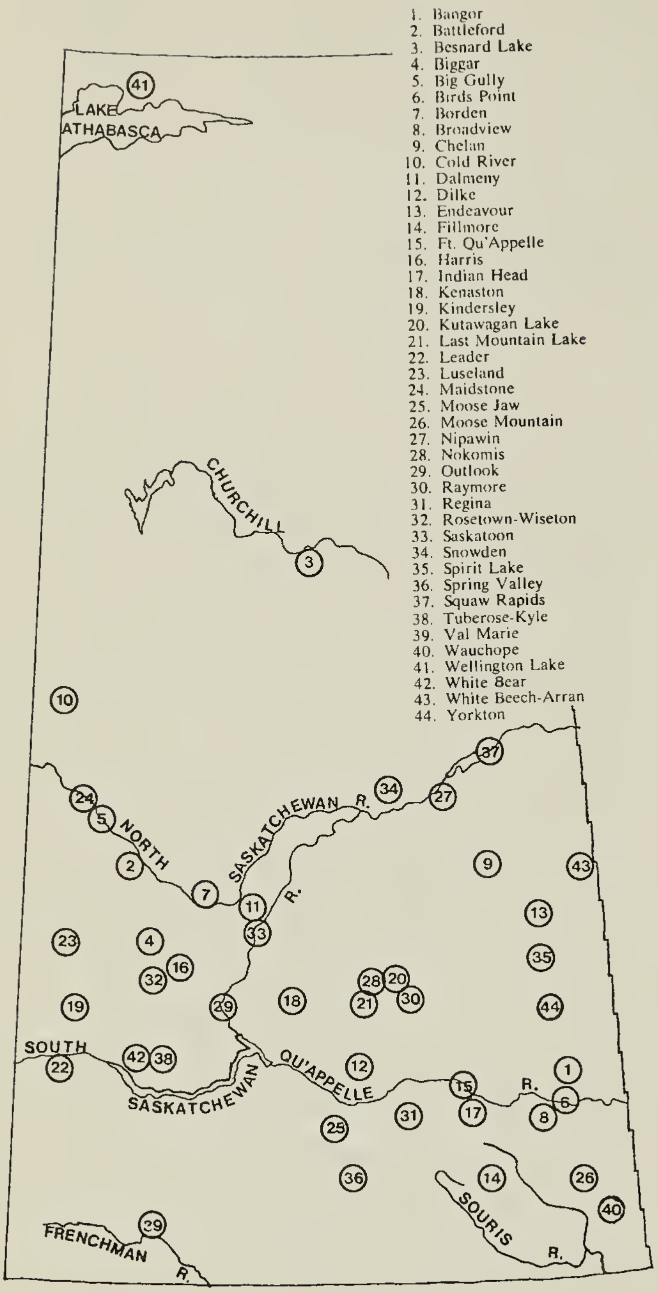
*863 University Drive,
Saskatoon, Sask.

Species recorded from more than 1 locality on Count day

	Bangor Dec. 29	Battleford Dec. 26	Besnard L. Dec. 27	Biggar Dec. 23	Big Gully Dec. 19	Bird's Point Dec. 29	Borden Dec. 28	Broadview Dec. 26	Chelan Dec. 26	Cold River Dec. 15	Dalmeny Dec. 26
Mallard										73	
Pintail											
Redhead											
Lesser Scaup											
Common Goldeneye								1		26	
Goshawk			1	1							1
Rough-leg. Hawk		1									
Golden Eagle								1			
Bald Eagle										1	
Merlin											
Spruce Grouse			2								
Ruffed Grouse		2			3			2		1	
Sharp-tailed Grouse	8	1		28	7		22		2		19
Ring-neck. Pheasant											
Gray Partridge		8					14				20
Rock Dove		1		55			10				6
Mourning Dove											
Great Horned Owl				2	1		2	2			3
Snowy Owl	1			6					1		
Short-eared Owl											
Common Flicker											
Pileated Woodpecker			1								
Hairy Woodpecker	1		4		2	1		3			1
Downy Woodpecker	2		1	1	3	1		2			
Horned Lark				6			7				2
Gray Jay			67								
Blue Jay					2			1			
Black-billed Magpie	2	32		29	13	2	47	12	2	5	39
Common Raven			195						3	7	
Bl.-cap. Chickadee	4	6	22	13	1	4	22	5	4		10
Boreal Chickadee			31		2						
W-breasted Nuthateh						2		2			
R-breasted Nuthatch	1										
Brown Creeper											
American Robin											
Gold.-cr. Kinglet					45			12			
Bohemian Waxwing		399		133			23	2			15
Cedar Waxwing											
Northern Shrike											
Starling		1		1							1
House Sparrow	7	10		742	10	4	480	168	50		128
West. Meadowlark											
Rusty Blackbird											
Evening Grosbeak						30		16			
Pine Grosbeak		4			4						5
Hoary Redpoll			12								
Common Redpoll		13		14	1		137	72			20
Red Crossbill											
Dark-eyed Junco											
Snow Bunting		1		2				500		38	80
Single Species			2		2			2		1	



1. Bangor
2. Battleford
3. Besnard Lake
4. Biggar
5. Big Gully
6. Birds Point
7. Borden
8. Broadview
9. Chelan
10. Cold River
11. Dalmeny
12. Dilke
13. Endeavour
14. Fillmore
15. Ft. Qu'Appelle
16. Harris
17. Indian Head
18. Kenaston
19. Kindersley
20. Kutawagan Lake
21. Last Mountain Lake
22. Leader
23. Luseland
24. Maidstone
25. Moose Jaw
26. Moose Mountain
27. Nipawin
28. Nokomis
29. Outlook
30. Raymore
31. Regina
32. Rosetown-Wiseton
33. Saskatoon
34. Snowden
35. Spirit Lake
36. Spring Valley
37. Squaw Rapids
38. Tuberose-Kyle
39. Val Marie
40. Wauchope
41. Wellington Lake
42. White Bear
43. White Beech-Arran
44. Yorkton

8. BROADVIEW. Dec. 26; 120 miles by car in 7-1/2 hours, 2-1/2 miles on foot, temp. 29°, wind light; 18 species, 804 individuals. (Add: Sharp-tailed Grouse, 18, Dec. 24; Rock Dove, 50, Dec. 24; Horned Lark, 3, Dec. 24; Northern Shrike, 1, Dec. 24; Pine Grosbeak, 30, Dec. 25). — David Chaskavich, Don Weidl.

9. CHELAN. Dec. 26; 1 mile on foot, 5 miles on ski-doo, temp. 28°-32°, clear, calm, 4 inches of snow; 6 species, 62 individuals. — Joy Aspen, Keith Aspen, Lane Harris, Tim Harris.

10. COLD RIVER (54° 33'N, 109° 50'W). Dec. 15; 15 miles by car and 3 miles on foot, temp. 20°, overcast, calm; 8 species, 153 individuals. — William Haras.

11. DALMENY. Dec. 26; 41-1/2 miles on foot in 21-1/4 hours, temp. 15°-26°, wind W changing to SSE, cloudy periods; 15 species, 350 individuals. (Add: Ruffed Grouse, 1, Dec. 31) — Mara Johanson, Brian Sperling, Gilbert Sperling (compiler), Lloyd Sperling.

12. DILKE. Dec. 29; 78 miles by car, 3 miles on foot in 6-1/4 hours, temp. 10°-20°, wind SW 5-20 mph; 5 species, 332 individuals. (Add: Rough-legged Hawk, 1, Dec. 27; American Merlin, 1, Dec. 27; Snowy Owl, 1, Dec. 20, 28). — J. B. Belcher, Margaret Belcher, Mr. and Mrs. S. R. Belcher, Stan Houston, Ken McArton, Peg Mortin.

13. ENDEAVOUR. Dec. 21; around farmyard, temp. 10°, overcast, calm; 8 species, 150 individuals. (Add: Ruffed Grouse, 1, Dec. 23; Snowy Owl, 1, Dec. 24; Downy Woodpecker, 1, Dec. 23; Gray Jay, 1, Dec. 24; Evening Grosbeak, 5, Dec. 25; Common Redpoll, 58, Dec. 27). — William Haras.

14. FILLMORE. Dec. 26; 21 miles by car in 1-1/2 hours, 1 mile on foot in 1 hour, around 2 yards 3/4 hour, temp. 22°, sunny, wind light, 10 inches of snow; 7 species, 296 individuals. (Add: Golden Eagle, 1, Dec. 24; Snow Bunting, 260, Dec. 24). — Flossie Bogdan (compiler), Larry Wiggins, Marie Wiggins, Michael Wiggins, Michelle Wiggins.

15. FORT QU'APPELLE. Dec. 28; 30 miles by car and 1 mile on foot in 3-1/2 hours, 3-1/2 miles on skis in 2 hours, temp. 25°, wind light, partly cloudy, 3-1/2 inches of snow; 4 species, 91 individuals. (Add: Mallard, 1, Dec. 15, 18, Dec. 16, 2, Dec. 26, 3, Dec. 30; Common Goldeneye, 31, Dec. 16, 4, Dec. 25; Ruffed Grouse, 3, Dec. 25; Snowy Owl, 1, Dec. 19; Downy Woodpecker, 1, Dec. 18; Blue Jay, 1, Dec. 15). — Arthur Bredalsen, Mrs. Jenny Gray, Inez and Joe Kralkay, Mrs. Dorothy Williams, Kay de Vries (compiler), Bernard de Vries. (Members and Guests of the Fort Qu'Appelle Naturalists' Society.)

16. HARRIS. Dec. 15; 31-1/2 miles on foot in 15 hours, 290 miles by car in 18-1/2 hours, temp. 20°-23°, overcast, wind NW 0-8 mph, no snow; 26 species, 2149 individuals. — Bob Godwin, Wayne Harris, Mary and Stuart Houston, Sheila Lamont, Ken Lumbis, Kathy Meers, John Polson, Don Renaud (compiler), Guy Wapple, Jim and Shirley Wedgwood.

17. INDIAN HEAD. Dec. 29; 35 miles by car in 3 hours, 4-1/2 miles on foot in 4 hours, temp. 20°-30°, calm, sunny, 8 inches of snow; 20 species, 1417 individuals. (Add: Peregrine Falcon, 1, Dec. 23, 27; Sharp-tailed Grouse, 50, Dec. 27; Ring-necked Pheasant, 1, Dec. 26; Mourning Dove, 2, Dec. 23; Long-eared Owl, 1, Jan. 1; Horned Lark, 6, Dec. 28; Blue Jay, 1 Dec. 28; Golden-crowned Kinglet, 6, Dec 28; Common Redpoll, 50, Dec. 26.) — Betty and Cec Ashmore, Peter and Therese

Species recorded from more than 1 locality on Count day

	Dilke Dec. 29	Endeavour Dec. 21	Fillmore Dec. 26	Ft. Qu'Appelle Dec. 28	Harris Dec. 15	Indian Head Dec. 29	Kenaston Dec. 19	Kindersley Jan. 3	Kutawagan Lake Dec. 30	Last Mountain Lake Dec. 28	Leader Dec. 20
Mallard						150					
Pintail											
Redhead											
Lesser Scaup						9					
Common Goldeneye											
Goshawk									1		
Rough-leg. Hawk											
Golden Eagle					1						
Bald Eagle					1	4					
Merlin					1						
Spruce Grouse											
Ruffed Grouse						4					
Sharp-tailed Grouse		12	15		180		9			12	
Ring-neck. Pheasant											1
Gray Partridge			6		35	21	10				
Rock Dove	6		13		60	21	15		27	6	
Mourning Dove											1
Great Horned Owl					6	1			1	1	
Snowy Owl					10	3		2		1	
Short-eared Owl					1					6	
Common Flicker					1						
Pileated Woodpecker											
Hairy Woodpecker		1			1	2	1				
Downy Woodpecker					1	3			1		
Horned Lark			2		2		7				
Gray Jay											
Blue Jay											
Black-billed Magpie	54	3	9	4	292	18	9	3	37	41	12
Common Raven		26									
Bl.-cap. Chickadee	2	3		8	13	7					2
Boreal Chickadee						1					
W-breasted Nuthatch				1							
R-breasted Nuthatch						4					
Brown Creeper						1					
American Robin						2					
Gold.-cr. Kinglet					3		1				2
Bohemian Waxwing					88	75					9
Cedar Waxwing					2						
Northern Shrike							1				
Starling					10						
House Sparrow	269	28	236	78	1403	1000	75	50	360	306	6
West. Meadowlark											
Rusty Blackbird					4						
Evening Grosbeak											
Pine Grosbeak		21			1						
Hoary Redpoll											
Common Redpoll			15		23		3	2	71		
Red Crossbill					1						
Dark-eyed Junco					2	1					
Snow Bunting	1	56			7	90	9	100	1	191	
Single Species											

Species recorded from more than 1 locality on Count day

	Luseland Jan. 1	Maidstone Ferry Dec. 24	Moose Jaw Dec. 26	Moose Mountain Dec. 29	Nipawin Dec. 27	Nokomis Dec. 30	Outlook Dec. 26	Raymore Dec. 29	Regina Dec. 26	Rosetown Dec. 26	Saskatoon Dec. 26
Mallard									500		74
Pintail									1		3
Redhead									3		
Lesser Scaup									9		8
Common Goldeneye									8		130
Goshawk								1			3
Rough-leg. Hawk											1
Golden Eagle											1
Bald Eagle		1									
Merlin						1			4		6
Spruce Grouse											
Ruffed Grouse		2		1	1			1			6
Sharp-tailed Grouse	9	4	2			3		11	7		59
Ring-neck. Pheasant			14								10
Gray Partridge	9								47	19	57
Rock Dove	4	1	194		5		17	140	360	6	805
Mourning Dove											1
Great Horned Owl	1	1	1				1	2	1		6
Snowy Owl	3		3			1	2	1	10	2	11
Short-eared Owl						3			1		
Common Flicker											1
Pileated Woodpecker											
Hairy Woodpecker		3		5	2			1			4
Downy Woodpecker	1	1		2	1			1	1		10
Horned Lark	3		1					2		3	6
Gray Jay											
Blue Jay		1		11	1						15
Black-billed Magpie	60	27	71	12	12	18	2	95	53	7	381
Common Raven		1			29						
Bl.-cap. Chickadee	1	6	2	7	3			11	2		109
Boreal Chickadee					2						2
W-breasted Nuthatch				1							
R-breasted Nuthatch				9					11		8
Brown Creeper									3		
American Robin											1
Gold.-cr. Kinglet	1		6	2					13		10
Bohemian Waxwing	114		3		2	1		69			887
Cedar Waxwing			5								59
Northern Shrike		1							3		
Starling			21						115	10	51
House Sparrow	163	20	920		20	103	6	1770	4132	150	2796
West. Meadowlark	1								1		
Rusty Blackbird									5		
Evening Grosbeak					81			2			1
Pine Grosbeak		1	6	17	4						1
Hoary Redpoll	1	1									
Common Redpoll	82	335	60	2	96				45		285
Red Crossbill											4
Dark-eyed Junco											3
Snow Bunting	127	839	1			50	10	58	1554	180	160
Single Species									13		5

rrett, Carol and Marg Beaulieu, Ernie d Hazel Buglass, Helen King, Rose cLaughlin, Lorne Scott, Ken Skinner, ry Skinner (compiler).

. KENASTON. Dec. 19; temp. 25°, nny, calm, 2 inches of snow: 11 species, 0 individuals. (Add: Great Horned Owl, c. 21; Snowy Owl, Dec. 20, 28, 29; Snow nting, 500, Dec. 20). — P. Lawrence ckie.

. KINDERSLEY. Jan. 3; 10 miles by r, 1/4 mile on foot, temp. 28°, clear, lm, 1 inch of snow; 5 species, 157 in- viduals. — Jean M. Harris.

). KUTAWAGAN LAKE (centered 12 iles north of Semans). Dec. 30; 55 miles car in 5 hours and 5-1/2 miles on foot in hours, temp. 12°-27°, overcast, wind S to 5-10 mph., 4 inches of snow; 8 species, 9 individuals. (Add: Canada Goose, 1, ec. 20; Snowy Owl, 1, Dec. 23). — Duane d Ken Harding, Wayne Harris, Sheila mont.

1. LAST MOUNTAIN LAKE anagement unit and immediate area). ec. 28; 103 miles by car in 5 hours and 6 iles on foot in 2 hours, temp. 16°-20°, nny, wind WSW 10 to 25 mph, 4 inches snow; 8 species, 564 individuals. (Add: ugh-legged Hawk, 1, Dec. 27; Starling, Dec. 27). — Greta Harris, Wayne arris, Sheila Lamont.

. LEADER. Dec. 20; 9 miles by car, d on foot about farm for 3 hours, temp. °, clear, calm, no snow; 7 species, 33 in- viduals. — Daisy Meyers.

. LUSELAND. Jan. 1; 40 miles by car in hours, 5 miles on foot in 5 hours, temp. °-32°, 50% high overcast, calm, 2 inches snow; 16 species, 580 individuals. — rry Finley, Kim Finley, Bill Holton, ayne Renaud.

. MAIDSTONE FERRY (21 miles north Maidstone). Dec. 24; 60 miles by car in 3 urs and 7 miles on foot in 3 hours, temp. to 21°, cloudy, wind S to NW 10 mph, 6 ches of snow; 17 species, 1245 in- viduals. (Add: Horned Lark, 4, Dec. 22). Wayne Harris, Sheila Lamont.

. MOOSE JAW. Dec. 26; 121 miles by r and 3 miles on foot, temp. 29°, sunny, nd W 10 mph, 2 inches of snow; 16 ecies, 1310 individuals. — Jeanette and ane Fjetland, Doug Francis, Ruth Hill, t Kern, Leith and Cy Knight, Moray wis.

. MOOSE MOUNTAIN. Dec. 29; 65 iles by car in 5 hours, 2-1/2 miles on foot, mp. 20°, clear, calm; 11 species, 69 in- viduals. — David Chaskavich, Don eidl.

27. NIPAWIN. Dec. 27; 116 miles in 5 hours by car, 4 hours on foot, temp. 30°, mostly clear; 14 species, 259 individuals. — David Riome, Stan Riome.

28. NOKOMIS. Dec. 30; 56 mi. by car in 3 hours and 10 minutes; temp. 15°-28°, sunny then light overcast, very little snow; 8 species, 180 individuals. — Jim Hamilton (compiler), Jack Woods.

29. OUTLOOK. Dec. 26; temp. 20°, wind SE, 1 inch of snow; 6 species, 38 individuals. (Add: Mallard, 21, Dec. 27; Common Goldeneye, 2, Dec. 27). — Harold Kvinge.

30. RAYMORE. Dec. 29; 136 miles by car in 6 hours and 10-1/2 miles on foot in 5-1/2 hours, 1 hour at feeder, temp. 0°-16°, clear, wind SW 10-25 mph, 4-1/2 inches of snow; 15 species, 2165 individuals. (Add: Rough-legged Hawk, 1, Dec. 23; Northern Shrike, 1, Dec. 24; Common Redpoll, 10, Dec. 27 and 75, Dec. 30). — Chas., Greta and Wayne Harris, Sheila Lamont.

31. REGINA. Dec. 26; 607 miles by car in 48 hours, 43 miles on foot in 25 hours, 8 hours at feeders, temp. 16°-25°, clear, W wind 10 mph, snow 0-20 inches; 38 species, 7779 individuals. (Add: Gadwall, 1; Blue-winged Teal, 2; American Wigeon, 1; Bufflehead, 1; Common Flicker, 1; Hairy Woodpecker, 1; Horned Lark, 7; American Robin, 5; Bohemian Waxwing, 9; Cedar Waxwing, 4; Evening Grosbeak, 1; Pine Grosbeak, 2; White-winged Crossbill, 1; Dark-eyed Junco, 3). — Joan Ackerman, Gary Anweiler, Jessie Bailey, Joan Baron, Gordon Barr, Keith Barr, Margaret Belcher, Rev. Tom Beveridge, Mrs. T. Beveridge, Al Binnie, Betty Binnie, Greg Bobbitt, Robbie Boychuk, Frank Brazier, Eric Cooke, Betty Cruickshank, Robyn Donison, Lucy Eley, George Ferguson, Wayne Gemmell, Jan Harrigan, Al Harrison, Val Harrison, Jim Hines, Rose Hines, Melissa Jackson, Jim Jowsey, Shirley Jowsey, Elizabeth and Ernie Kassian, Darlene Kauk, Shirley Larmour, George Ledingham, K. Leibel, Bob Luterbach, Pat MacKenzie, Joe Miller, Will Marchuk, Ken Mayer, Madeleine McGinnis, George Mitchell, Helen Morrison, Frank Nargang, Dave Phillips, Connie Pratt, Brian Rainey, Joe Roberts, Carole Spencer, John Spencer, Rick St. Pierre, Frank Switzer, Bob Tegart, Dorothy Tegart, Les Toews, Fred Wagner, Dale Weisbrot, Bernard Wilhelm, Christopher Wilhelm, Janie Wilhelm, Pierre Wilhelm, Rita Wilhelm, Cheryl Zagozeski.

32. ROSETOWN-WISETON. Dec. 26; 60 miles by car in 2 hours, 3-1/2 miles on foot in 2 hours, temp. 25°-30°, clear, 1 inch of

Species recorded from more than 1 locality on Count day

	Snowden Dec. 28	Spirit Lake Dec. 26	Spring Valley Dec. 29	Squaw Rapids Dec. 26	Tuberose Dec. 26	Val Marie Dec. 31	Wauchope Dec. 24	Wellington Lake Dec. 29	White Bear Dec. 30	White Beach Dec. 25	Yorkton Dec. 29	No. of Counts Species Seen
Mallard				5								5
Pintail												2
Redhead				1								2
Lesser Scaup												3
Common Goldeneye				25								5
Goshawk												6
Rough-leg. Hawk												2
Golden Eagle			2			1						5
Bald Eagle				2								5
Merlin												4
Spruce Grouse				1								2
Ruffed Grouse				3								11
Sharp-tailed Grouse		9		1		28					9	23
Ring-neck. Pheasant												3
Gray Partridge			31				8		14			14
Rock Dove			28		8		34					23
Mourning Dove												2
Great Horned Owl		1								1	1	19
Snowy Owl		1	4								3	18
Short-eared Owl			1						2			6
Common Flicker												2
Pileated Woodpecker				1								2
Hairy Woodpecker		4		1			3	2				19
Downy Woodpecker	1	7		1			1				2	21
Horned Lark			4			6	26					14
Gray Jay				6				3				3
Blue Jay		2		1					1			9
Black-billed Magpie		18	10	24	7	2	9		7	1	33	41
Common Raven	2	1		21				3		8	2	12
Bl.-cap. Chickadee	2	23		8			8	2		5		30
Boreal Chickadee								2				6
W-breasted Nuthatch		2										5
R-breasted Nuthatch							2					6
Brown Creeper												2
American Robin												2
Gold.-cr. Kinglet		2					5					12
Bohemian Waxwing		8								16	9	17
Cedar Waxwing												3
Northern Shrike				1								4
Starling			5									9
House Sparrow	42	214	263	12			310			6	505	37
West. Meadowlark												2
Rusty Blackbird												2
Evening Grosbeak		4		17						1		8
Pine Grosbeak		3		3						4		13
Hoary Redpoll												3
Common Redpoll	6	91	4				13	21			125	24
Red Crossbill												2
Dark-eyed Junco												3
Snow Bunting	6		70	1000	30		142			50		28
Single Species							1	2	1			

ow; 8 species, 377 individuals. — Alan, ian and Grev Jones, Chester Walker.

. SASKATOON. Dec. 26; 300 miles by r in 39-1/2 hours, 107 miles on foot in 67 urs, temp. 17°-28°, wind W-SW 2-10 ph, clear, 1-2 inches of snow; 42 species, 82 individuals. (Add: Gadwall, 1, Jan. 1; own Creeper, 1, Dec. 25; White-winged rossbill, 3, Dec. 20). — Mark Abley, oira Atkinson, Bob, Garth, Jeff and Joyce esant, Bernard, Ed, Raymond and imothy Bisha, Ron Bobowski, Andre uthilette, Joe Daly, Alan, Edward, and artley Fredeen, Marie Gillespie, J.B. and adeleine Gollop, Jack Greaves, Scott ale, Bert Hardy, Wayne Harris, Jimmy effernan, Frank Hough, Dave, Don, ary, Stan and Stuart Houston, Ann and lark Jeffries, Sheila Lamont; Anna and d Leighton, Robbie Mahood, Don and anne McRobbie, Aileen, Gray, Michael d Paul Merriam, Greg Michalenko, Anna Miller, Arnold, Carmen and Ingrid Nijssen, Lynn Oliphant, Stuart Rasmussen, Don and Wayne Renaud, Adam and David Schmidt, John, Mary and Stan Shadick, Alan, Eric and Garry Smith, Doug Whitfield, Elmer Wright, Lucy Young.

34. SNOWDEN. Dec. 28; 7 miles by car in 1-1/2 hours, 4 miles on foot in 3 hours, temp. 20°, wind 15-20 mph., sunny, 8-10 inches of snow; 6 species, 59 individuals. (Add: Snowy Owl, 1, Dec. 23). — Juliana Soroka.

35. SPIRIT LAKE. Dec. 26; 3 miles on foot in 3 hours, 54 miles by car in 4 hours, temp. 33°, wind W 15 mph, mostly clear, 5 inches of snow; 16 species, 390 individuals. (Add: Goshawk, 1, Dec. 21; Ruffed Grouse, 2, Dec. 27; Snow Bunting, 15, Dec. 21). — Bill and Joyce Anaka, Mrs. Gunn.

36. SPRING VALLEY. Dec. 29; 42 miles by car in 3-1/2 hours, 8 miles on foot in 2-

Species recorded from only 1 locality on Count day.

o.	*Species*	*Locality*	*Map No.*
1	Eared Grebe	Regina	31
1	Pied-billed Grebe	Regina	31
2	Mute Swan	Regina	31
875	Canada Goose	Regina	31
1	White-fronted Goose	Saskatoon	33
1	Snow Goose	Regina	31
1	Ross's Goose	Regina	31
1	Gadwall	Broadview	8
2	Green-winged Teal	Saskatoon	33
2	American Wigeon	Broadview	8
1	Northern Shoveler	Saskatoon	33
1	Canvasback	Regina	31
1	Greater Scaup	Regina	31
2	White-winged Scoter	Cold River	10
2	Ruddy Duck	Regina	31
1	Hooded Merganser	Regina	31
1	Sharp-shinned Hawk	Big Gully	5
1	Gyrfalcon	Regina	31
1	Prairie Falcon	White Bear	42
5	Willow Ptarmigan	Wellington Lake	41
2	American Coot	Regina	31
1	Hawk Owl	Wellington Lake	41
2	Black-backed 3-toed Woodpecker	Besnard Lake	3
1	Northern 3-toed Woodpecker	Besnard Lake	3
1	Red-winged Blackbird	Wauchope	40
1	Common Grackle	Regina	31
4	White-winged Crossbill	Big Gully	5
2	Tree Sparrow	Saskatoon	33
1	White-crowned Sparrow	Saskatoon	33

3/4 hours, around yard 3/4 hour, temp. 10°-22°, sunny, wind brisk, 8 inches of snow; 11 species, 422 individuals. (Add: Prairie Falcon, 1, Dec. 17; Sharp-tailed Grouse, 5, Dec. 20 and 6, Dec. 30; Great Horned Owl, 1, Dec. 27, 28; Northern Shrike, 1, Dec. 30). — Allan Bogdan, Flossie Bogdan (compiler), Larry Bogdan, Nick Bogdan.

37. SQUAW RAPIDS. Dec. 26; 7 hours in field, temp. 25°, overcast, no wind; 20 species, 1134 individuals. — Gladys and Stan Riome.

38. TUBEROSE-KYLE. Dec. 26; 64 miles by car and 1-1/2 miles on foot in 3 hours, temp. 18°, wind SE 8 mph, clear; 3 species, 45 individuals. — Cliff Matthews.

39. VAL MARIE. Dec. 31; 50 miles by car and 2 miles on foot, temp. 28°, sunny, calm, 2 inches of snow; 4 species, 37 individuals. (Add: Prairie Falcon, 1, Dec. 24; Gray Partridge, 3, Dec. 26; Snowy Owl, 1, Dec. 29; Common Redpoll, 3, Dec. 24; Snow Bunting, 100, Dec. 26). — J. David Chandler.

40. WAUCHOPE. Dec. 24; 33-1/2 miles (53.6 km) by car in 3 hours, 3 miles (4.8 km) on foot in 3 hours, and watching feeder throughout day, temp. -4°F to 22°F (-20°C to -6°C), wind SW 3-4 mph (4-5 km) in P.M., overcast and heavy fog in A.M., clearing mid morning, then partial cloud cover, snow 10 inches (28 cm); 13 species, 562 individuals. (Add: Sharp-tailed Grouse, 4, Dec. 23; Ring-necked Pheasant, 1, Dec. 25; Evening Grosbeak, 11, Dec. 30). — Dale Hjertaas (compiler), Elinor Hjertaas, Warren Hjertaas.

41. WELLINGTON LAKE (59° 38'N 109° 02'W). Dec. 29; temp. 19°, calm; 8 species, 39 individuals. — Edith and Roy Middleton.

42. WHITE BEAR. Dec. 30; 5-1/2 miles by car, 3 miles on foot, temp. 30°, light west wind, sunny, light snow cover; 5 species, 25 individuals. (Add: Mourning Dove, 1, Dec. 26). — Carl and Peter Bischoff, Oran Cates, Leroy Clark, Douglas Gunn, Gary, Laine and Sig Jordheim, David Lowe, Dan Schuler (White Bear Conservation Club).

43. WHITE BEECH-ARRAN. Dec. 25; 65 miles by car and at feeding station, 9 species, 92 individuals. — Margaret Hutchinson, Mr. and Mrs. L. A. Wotherspoon.

44. YORKTON. Dec. 29; 76 miles by car and 2 miles on foot, temp. 6°, sunny, wind S 6 mph, 5 inches of snow; 9 species, 689 individuals. — Margaret Bromley (compiler), Lorne Lepp, Larry Morgotch, Phil Pawluck, Harold Wilkinson.

FORT SMITH, N.W.T., CHRISTMAS BIRD COUNT

by ERNIE KUYT*

Date: December 28, 1974.

Weather: Sunny and clear; tem perature −18°F; light wind; sno depth about 27 cm; daylight 9:00 a.m - 4:00 p.m.

Routes covered: Fort Smith to Fo Holes road intersection; ·Fort Smit along Pine Lake road to Salt Rive Fort Smith to Mountain Portage o cross-country skis. Total 80 + 48 12 = 140 km. from 10 - 2 p.m.

Birds seen: Raven 141, Gray Jay 1 Rock Dove 45, Spruce Grouse Sharp-tailed grouse 8, Willow Pta migan 1, Hairy Woodpecker 1, Dow Woodpecker 1, Pine Grosbeak 21+ Hoary Redpoll 23, Black-cappe Chickadee 4, House Sparrow 4.

Contributors: Elsie, Ernie, Pamel Jonathan Kuyt; Linda and Da Graham; Hilah, Norman, David Sim mons; Debbie, Rex, Billie, J Coupland; Alan Lee and Jim Mills.

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*Box 508,
Fort Smith, N.W.T.

WATCH FOR MARKED COWBIRDS

Over 7,100 Brown-heade Cowbirds were banded and colour marked in west-central Kansa during 1974 as an aid in studyin their movements and, hopefully, t determine their places of origin Birds were marked with red, yello or green plastic leg streamers. Fal and winter observations reveale 27 individuals from 10 locations i Kansas, Oklahoma, Texas an Mexico. However, data from sprin and summer movements ar needed. Observers can help b reporting location and date o sighting, sex of bird, and colour o leg streamer to Richard A. Hill Department of Biology, Fort Hay Kansas State College, Hays, Kansa 67601.

FLORIDA CHRISTMAS BIRD COUNT

by J. F. ROY*

lmetto-pine pasture, Tampa, Florida. Frank Roy

153 species and over 70,000 in-
viduals in a single day? Having to
op for extra drinks at noon because
e blazing sun had raised the mercury
just under 80°? Pileated Wood-
ckers, Purple Finches, Barred Owls,
d Great Horned Owls within a
uple miles of Common Gallinules,
hingas, White Ibis and a Limpkin?
here? When? It was Tampa, Florida,
ecember 28, 1974. The occasion:
mpa's annual Christmas Bird
unt.

When I knew I might be in Florida in time for one of the later Christmas Counts, I checked Audubon Society's *American Birds* for the names of the organizers of last year's Florida counts. Bill Courser, a biologist with the Southwest Florida Water Management District, had compiled the Tampa count. I telephoned him as soon as I arrived in that large city on the Gulf of Mexico, mid-way down the west coast of the state.

"Will you let an ignorant Northerner who doesn't know the difference between an immature Green Heron and a Least Bittern join you on Saturday?"

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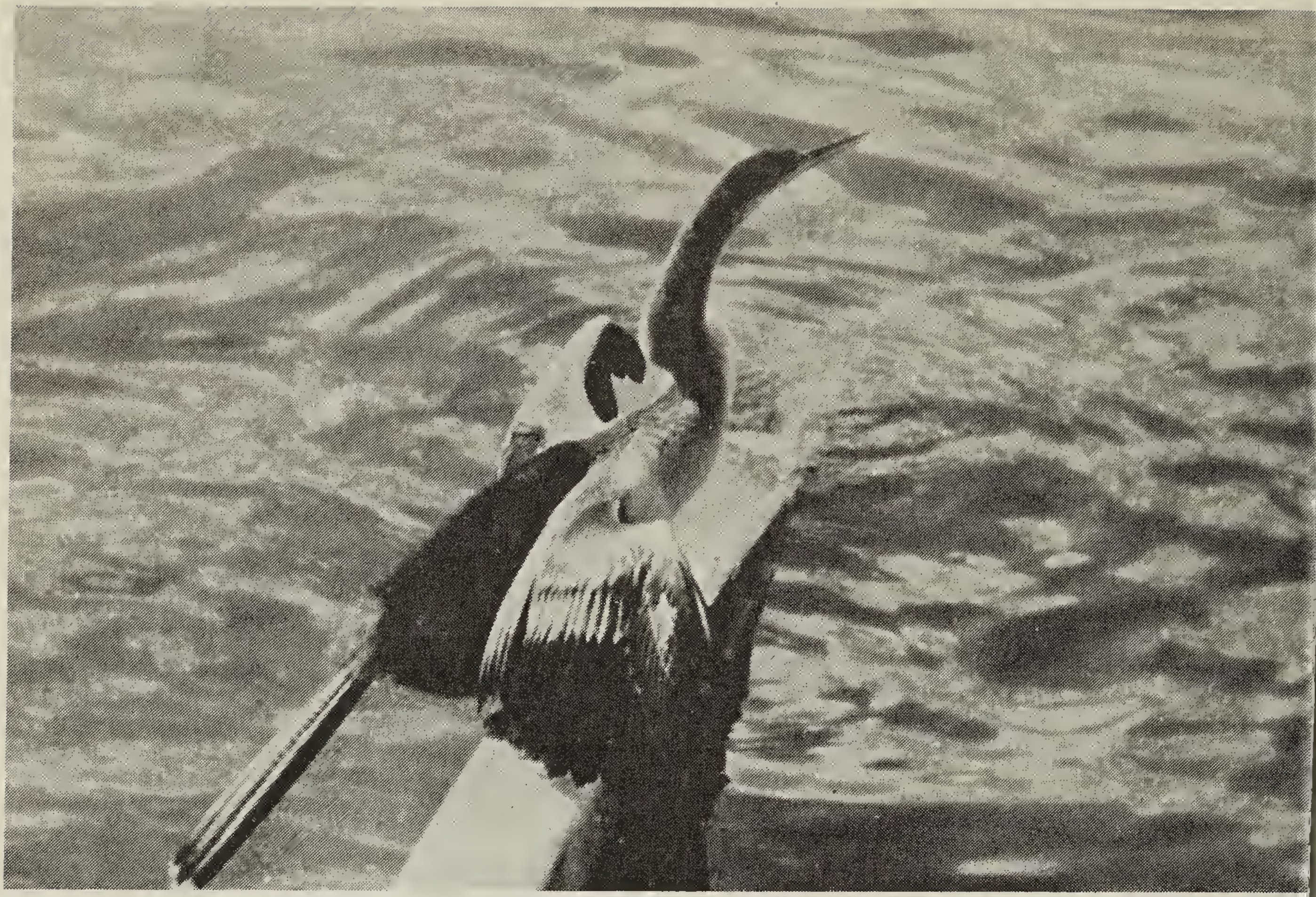
702 Sommerfeld Avenue,
skatoon, Saskatchewan.



Anhinga, Cypress Gardens, Florida.

Frank R

"Welcome on board," he said. Meet us at Morrison's Cafeteria at Fletcher and 30th at 6:30 a.m. We want to be in the field before sunrise at seven. I'll be out counting owls at 4:00 a.m., but I'll join you there."

I made a dry-run out to the rendezvous spot the day before the count — 17 miles across the city from our hotel. A wise decision, it turned out. Unusually warm weather had resulted in several dense morning fogs in recent days. December 28 produced a real pea-souper, rolling in from the Gulf of Mexico. I left the hotel at 5:30 in case I should lose my way in the fog. Luck was with me. I parked at Morrison's and waited.

The city was still quiet. A Killdeer called; a flock of Boat-tailed Grackles flew over. Precisely at 6:30 a well-used Dodge station wagon rolled onto the lot. Four men stepped out into the mist: Bill Courser, Ron Mumme, Dale De Wild, and Ed Caldwell were ready to introduce me to the winter birds of the Tampa region.

Our assignment was to canvass th northeast section of the count area. W would scour palmetto and pi pastures, deciduous forest, roadside the marsh on the campus of th University of South Florida, an aba doned airport, and the weedy fiel adjacent to Busch Gardens.

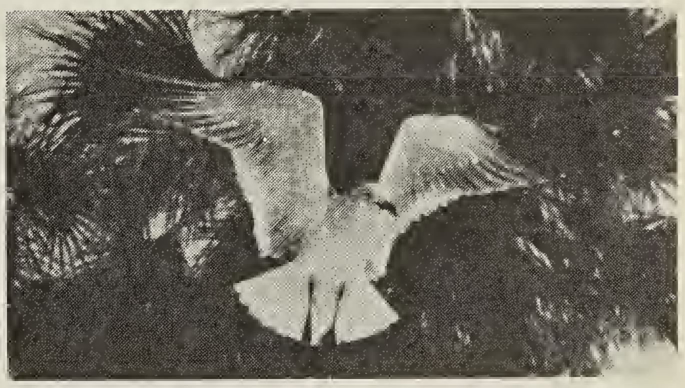
Visibility was only fair until abo 10 a.m. when the hot sun burned the fog. Having been granted pe mission to walk the woods a pastures of a large ranch just north the city, we broke into two groups. B Courser, Dale De Wild and I head into the forest: the other fellows plored the banks of the Hillsborou River. Contrary to my expectatio the forest floor was open — the resu I suppose, of dense summer folia Now most of the trees were leafless oak, ash and maple. Several species f evergreen oak and palm provid splashes of green. At times it was underfoot, and I learned to skirt boggy places.

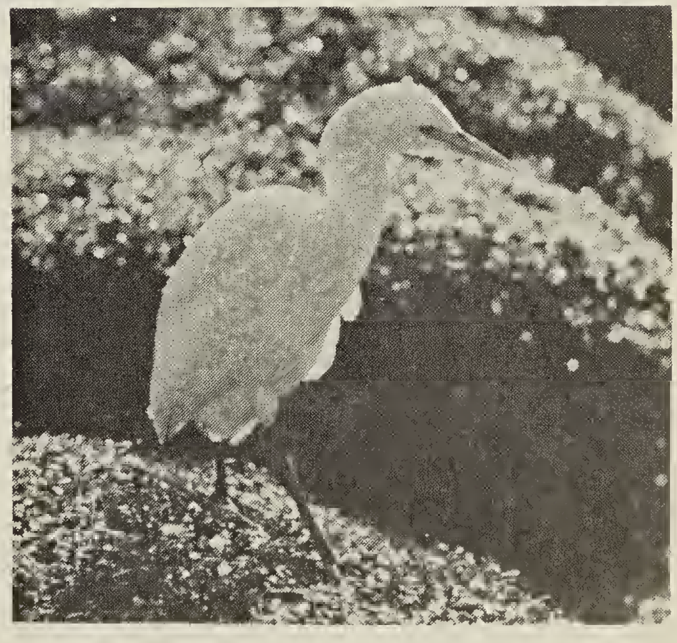
The woods, dripping wet in the fog, were alive with sounds, several of hem alien to my ears. On all sides we heard the raucous cries of Blue Jays and Red-shouldered Hawks, both common in central Florida. Great Horned and Barred Owls hooted in he distance. I soon learned to ecognize the nasal calls of the Blue-gray Gnatcatcher, a relative of our kinglets. Yellow-rumped Warblers flitted everywhere in the branches overhead, and I identified my first White-eyed Vireos. Solitary Vireos, Carolina Wrens (what a beautiful song), Tufted Titmice, Cardinals, numerous silent winter Robins, Goldfinches, Yellow-shafted Flickers and Yellow-bellied Sapsuckers moved hrough and above the trees. Three immature Purple Finches alighted on a ree just above our heads. A rarity in Florida, they were an unexpected addition to the count. My familiarity with them in Saskatchewan helped us o confirm their identification.

Moving out to more open areas, doted with palmetto, bushes and scatered slash pines, we were scolded by numerous House Wrens, more furtive han when we see them in Saskatchewan. Here, too, we saw numbers of Mockingbirds (surely one of the most common birds in Florida), Mourning Doves, Loggerhead Shrikes, Tree Swallows and Palm Warblers. After mid-morning, Turkey Vultures began o sweep in great circles overhead.

Using sticks to beat the grass and palmetto plants, we sought to flush the ground sparrows that winter in the region. Incidentally, the sticks also serve a second purpose: they can alert he hiker to rattlesnakes, still fairly common in this region. Grass sparrow identification is difficult enough in Canada when the birds help by singing and perching on tall weeks; here, during the Florida winter, it is nearly impossible. Uttering only a single chirp as they fly up at your feet to drop again into dense grass or palmetto perhaps 25 yards ahead, they must be flushed time after time until a view is obtained of breast, or tail, or median and eyebrow lines. Here, and in brushy fields later in the afternoon, we identified Vesper Sparrows, Savannahs (the most numerous winter sparrow), Swamp Sparrows, and the scarce and local Bachman's Sparrow. We also raised a number of Eastern Meadowlarks, but many needed no coaxing. They flew to convenient posts or bushes to sing their characteristic *tsee-you, tsee-ear*, a far cry from the melodious cascades of their Western cousins.

Leaving the pasture-land, we skirted fence-lines on either side of the highway. Noon was approaching, and as at home on the May-Day Count, it was becoming harder to add new species. Bill, on the other side, identified a Grasshopper Sparrow. On my side of





Laughing Gull, Clearwater, Florida.
Cattle Egret, Busch Gardens, Florida.

the road I flushed a Bobwhite, and added a Sharp-shinned Hawk and a Black-and-White Warbler.

As we joined forces with the rest of the fellows, Ron Mumme, a veteran birdman still in his early 20's, asked me if I wanted to see a Limpkin. Another lifer for me, it stood in the shade on the banks of Cypress Creek. Restricted in range in the United States to Georgia and the Florida peninsula, it is a handsome, speckled, brown and white water bird related to the cranes and rails. Although we visited only a couple of ponds and marshes, we saw a number of other water birds during the day: Pied-billed Grebes, Great Blue Herons, Green Herons, Cattle Egrets (common all over Florida, even in the cities), Great Egrets, a flock of six White Ibis, Wood Ducks, Ring-necked and Ruddy Ducks, over 300 American Coots, Common Gallinules and several Snipe.

After lunch — a period of sporadic munching extending from 10 a.m. to 1 p.m. as it does everywhere on bird counts — we visited the 10-acre marsh on the University of South Florida campus, a beautiful spot, lush with cattails. How long it can be preserved is anybody's guess; the pressures to drain marshland are even greater in Florida than they are in Saskatchewan. The several hundred ducks which had been in the marsh the day before had taken wing, leaving behind a few Ring-necks and Ruddies and rafts of Coots and Gallinules.

We spent the late afternoon in what is known as the Tampa Industrial Park, a partially developed district with weedy fields and sparsely-grassed areas north and east of Busch Gardens, a popular preserve for exotic animals and birds. Here Bill Courser, an authority on the Florida race of the Burrowing Owl, showed us no fewer than nine birds. Imitating their call with ease, he soon brought these curious little owls out of their burrows. We even spotted sever
within the confines of Busch Garden
perfectly at home with the zebras, gnu
and African antelope which were cro
ping the grass at their very doorsteps.
asked Bill what kind of burrows thes
owls had taken over. "In the sands
Florida," he replied, "they use th
holes of the gopher turtle or they d
their own." No ground squirrels
badgers in Florida, I concluded.

The fields produced few ne
species, but more sparrows, dozens
Savannahs, in particula
Meadowlarks, Ground Doves, Bo
whites, Boat-tailed and Comm
Grackles, Cowbirds, and Palm War
lers.

The sun was setting when we retu
ned to Morrison's Cafeteria and
parked car. Our group had tallied
species — 70 short of the total cou
for the region, but a satisfactory nu
ber for the habitat to which Bill h
assigned us. In addition to the speci
already mentioned, I had se
Laughing Gulls, Fish Crows a
Yellow-throated Warblers, none
which, as far as I can determine, ha
yet been recorded in Saskatchewa
Rarities in Tampa on a Christm
Count included the Black-necked Sti
Eastern Kingbird, Great Crest
Flycatcher, Blackburnian Warble
Northern Waterthrush and Purp
Finch.

I learned more about Florida bi
life and winter plumages in that o
day than I would have done in a mon
of birding by myself. While Saskato
birders uncovered a record 42 speci
on Boxing Day, a migrant Saskatonia
2 days later, helped in a count whi
surpassed in number of species ma
of the May-Day Counts at home. I
fered my thanks to Bill Courser a
his friends, and suggested they mig
like to join us sometime on Boxi
Day when the temperature was -2
They made no promises!

THE PEREGRINE FALCON — PAST, PRESENT AND FUTURE

by LYNN W. OLIPHANT,* ROBERT RAFUSE and TOM DONALD

mmature Female Peale's Peregrine

Doug Bush

HE PEREGRINE AND MAN

In Europe, when the sport of alconry was at its height, the eregrine Falcon was perhaps the most ighly regarded and protected of all ird species. With the advent of irearms, falconry declined and with it he highly regarded status of the eregrine subsided as well. Man no longer cooperated with the falcon to capture game but was now a direct competitor.

In North America the Peregrine was labelled "Duck Hawk" and was persecuted because of its predatory habits. This dislike for hawks was not restricted to pigeon fanciers, game keepers and "sportsmen." Ornithologists and amateur birdwatchers also killed Peregrines because of their attacks on "good birds." Audubon, although probably not harboring the intense hatred of some, wrote of the Peregrine:

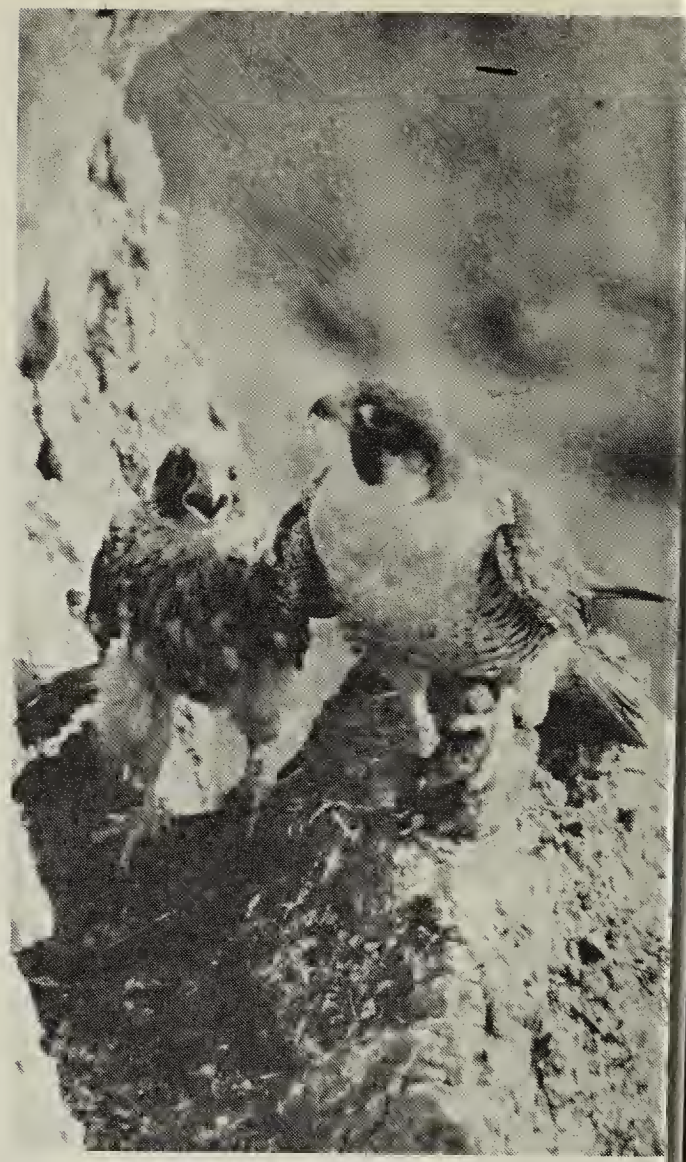
Department of Veterinary Anatomy,
University of Saskatchewan,
Saskatoon, Saskatchewan.
S7N 0W0

> "I can well recollect the time when, if I shot one or two individuals of the species in the course of a whole winter, I thought myself a fortunate mortal; whereas of late years I have shot two in one day, and perhaps a dozen in the course of a winter. It is quite impossible for me to account for this increase in their number, the more so that our plantations have equally increased, and we have now three gunners for every one that existed twenty years ago, and all of them ready to destroy a hawk of any kind whenever an occasion presents itself."[1]

Attitudes changed slowly and it was only within the last 20 years that the Peregrine has received widespread legal protection.

In the late 1950's, it became evident that all was not well with some Peregrine populations. A marked decrease in usage of traditional eyries in Europe and eastern North America was noted. In 1965, at Madison, Wisconsin, an international conference on the status of the Peregrine revealed the extent of the decrease in these populations. The Peregrine was virtually extinct as a breeding species in the eastern United States and had undergone serious declines in the western United States and southern Canada.[9]

A number of hypotheses that attempted to explain the decline were advanced at the Madison conference. The most widely accepted theory correlated the decline with the usage of certain persistent pesticides. Since the 1965 conference many studies have been conducted which substantiate this theory. Organochlorine pesticides are known to reach high levels in the tissues of predators through a cumulative effect as these chemicals pass through each level of a food chain. These persistent pesticides are believed to interfere with reproduction by causing thinning and accidental breakage of egg shells and possibly by altering behaviour of the adults.[15]

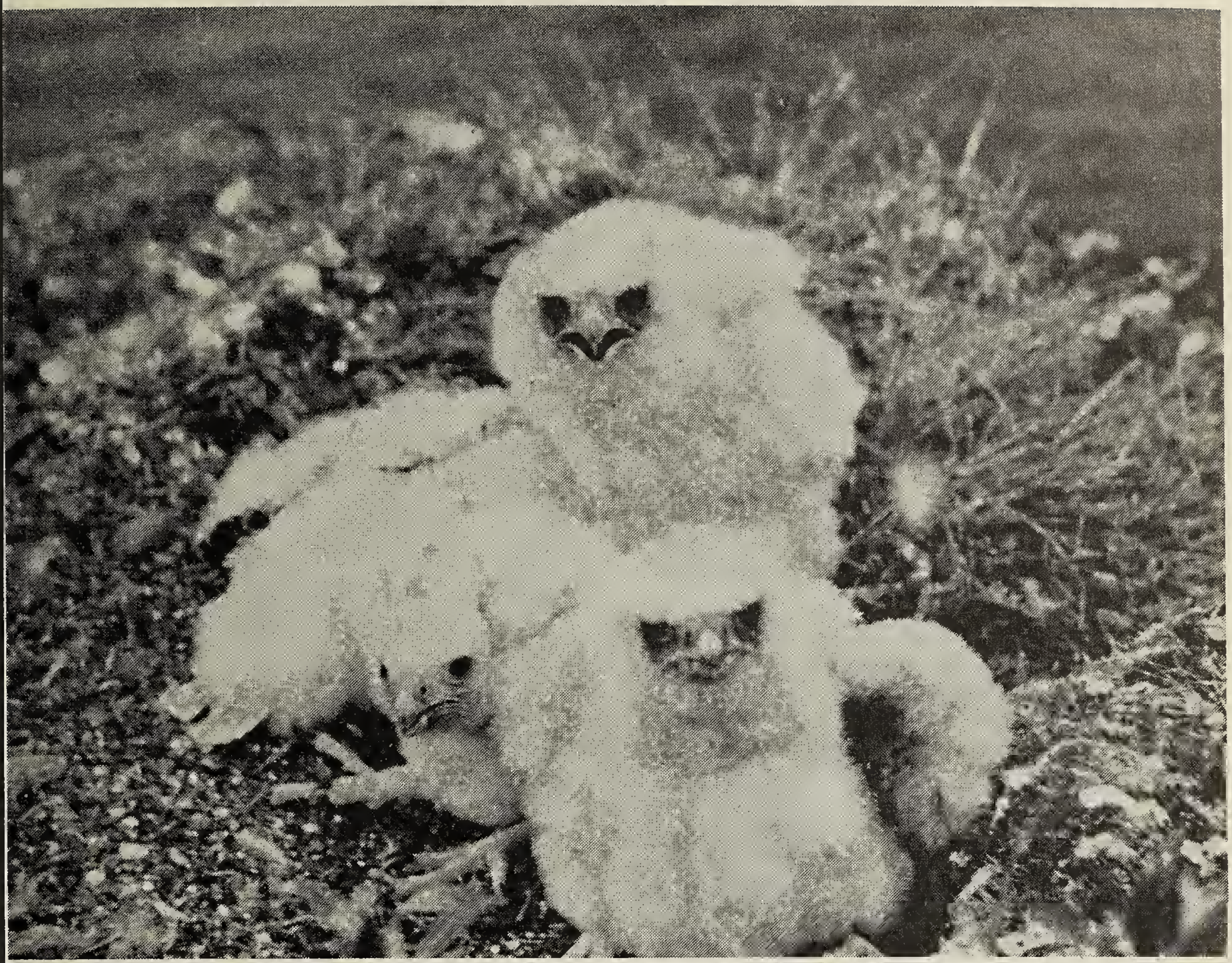


Female Peregrine with prey for 5-week-ol
young, Alberta. Richard Fyf

A tremendous amount of attentio has been focused on the extirpation o the Peregrines breeding in easter North America by many conservation oriented groups which have used th Peregrine to symbolize the plight o species endangered through man' abuse of the environment. Because o this, there has been a tendency fo people unfamiliar with the species t assume that the population in easter North America represented the majo breeding population on this continen

PRESENT STATUS OF THE PEREGRINE

The Peregrine has a world-wid distribution, occurring on all the con tinents except Antarctica and on mos of the major islands. It is found on greater portion of the land surface o



Four young Peregrines, Arctic. Richard Fyfe

the earth than perhaps any other bird species.[5] Eighteen subspecies are recognized. The present status of many of these subspecies is poorly known.

The viability of Peregrine populations in western Europe (*Falco peregrinus peregrinus* and *F.p. brookei*) varies greatly in different areas. The Peregrines of Spain, Portugal and Italy have large, viable populations with no evidence of a decline. This contrasts sharply with the rest of Europe which has suffered serious decreases.[17] The numbers of breeding Peregrines in Great Britain are well known with accurate data going back far before the advent of pesticides.[9] Prior to 1940 it is estimated that 85% of the 805 known eyries were occupied yearly by breeding pairs. A serious decline was noted in the 1950's and in 1963 the lowest point of occupancy (44% of pre-war expected numbers) was recorded. This was accompanied by poor production of young in the same year. Since then there has been some local recovery correlated with a decrease in the use of persistent pesticides. In 1971 a minimum of 341 eyries were occupied by pairs or single birds (55% of pre-war expected numbers).[16] It is estimated that a minimum of 300 fledglings per year have been produced during the last 3 to 4 years.[16 17]

In North America there are three recognized subspecies: the Peale's Peregrine *(F.p. pealei)*, the Tundra Peregrine *(F.p. tundrius)* and the Anatum Peregrine *(F.p. anatum)*.

The Peale's Peregrine breeds along the British Columbia coast through the Aleutian Islands of Alaska. The birds breeding on the Queen Charlotte Islands are among the densest known populations and numbered about 50 pair in 1968.[4] One well-studied part of this population declined to about one-third of its former numbers between the mid-1950's and the mid-1960's[7] but has remained more or less stable since then (Nelson and Myres, Condor, in press).

The population on the Aleutian Island chain has been estimated at 300 pair.[7] This population appears to be in good shape, experiencing rather low levels of pesticide contamination and eggshell thinning and reproducing fairly well but containing disconcerting levels of PCB's (an industrial pollutant).[19]

The Tundra Peregrine nests in Greenland and throughout the North American Arctic, north of the treeline. It represents the largest segment of the Peregrine population in North America and is the most migratory of the three subspecies, wintering in Central and South America.[18]

The Anatum Peregrine formerly inhabited most of the rest of North America. During the last few decades it disappeared as a breeding bird in the eastern United States and has been reduced to a few dozen pair in the western United States and southern Canada.[9] In a survey of the Rocky Mountain states in 1973, the population was found to have declined by at least 50% and the 14 pair found attempting to breed fledged a total of three young.[8] The Anatum still occurs in substantial, though reduced, numbers in the boreal forest from the interior of Alaska through the Yukon and Northwest Territories. In 1970 four previously studied areas were surveyed in this region and all showed between 40 and 65% occupancy.[7]

The combined populations of Anatum and Tundra Peregrines in northern Canada (north of 55°N) were estimated at over 7,500 breeding pairs in the mid-1960's.[9] At the time of the Madison Peregrine Conference (1965), the populations in northern Canada and Alaska appeared vigorous and unaffected by the decline which had taken place in southern Canada and in the southern 48 United States. By 1970, data on seven populations from Alaska to Ungava showed declines in the number of pairs, poor reproduction and/or evidence of relatively high pesticide levels.[2, 7, 11] The 1970 North American Peregrine Survey, organized by Tom Cade of the Cornell Laboratory of Ornithology and Richard Fyfe of the Canadian Wildlife Service, represented a great deal of effort by many investigators. Even so, only a portion of even prime Peregrine habitat could be covered — 117 eyries in northern Canada and Alaska, along with much potential nesting habitat. However, the fact that all the sample areas which were studied showed the falcons to be experiencing difficulties strongly suggested that the northern populations too had become involved in the same problems which had earlier crippled the southern populations. More recent work on Tundra and Anatum populations in both the Canadian and Alaskan Arctic indicate the declines are continuing to the extent that some populations of Tundra and Anatum Peregrines are on the verge of extinction. (R. Fyfe, pers comm.)

It is difficult to assess productivity of birds such as the Peregrines that breed at low densities over vast areas. Attempts have been made to monitor their population trends at concentration points during migration to avoid these difficulties. Migrating Peregrines pass down the Atlantic coast, over the Great Lakes and along the Gulf coast of Texas. Studies in these areas have indicated no obviou decrease in numbers in recent years and, in general, the adult/immature ratios of the migrants suggest that the northern populations have been eproducing well.[10] [16] It should be oted, however, that there probably re as many difficulties involved in rawing conclusions from migration ata as from field surveys of nesting opulations.

The number of Peregrines wintering n North America also may furnish aluable data. A total of 73 Peregrines ere reported in the United States on e 1973 Christmas Bird Count. Participants theoretically covered about -1/4% of the total area of the United tates during the count. If an even istribution of wintering Peregrines is ssumed and *every* Peregrine within e boundaries of the counts was seen nd counted only once, a projected *inimum* of 1,000 individuals is at-ined.[3] It should be remembered that ost of the arctic Peregrines probably inter south of the United States bor-er.[18]

Based on all available information it ppears likely that Peregrines in North America still number in the thousands. In spite of this, pesticide levels in many areas and evidence of local declines even in the far north are such that the continued existence of the Peregrine still appears to be threatened.

MANAGEMENT OF THE PEREGRINE

The future of the Peregrine depends upon enlightened management. Four basic strategies have been suggested: 1) increased legal protection, 2) preservation of an adequate environment, 3) management of wild populations, and 4) captive propagation and subsequent release.[6]

Enforced legal protection accompanied by public education are necessary to prevent losses due to "sport" shooting, predator control and unmanaged harvest for falconry. Another important aspect of legal protection is the preservation of nesting sites free from disturbance.

emale Peregrine with 2-week-old young, Alberta.

Richard Fyfe

Five-week-old young flapping, Alberta.
Richard Fyfe

Cade[6] has proposed that restricted zones be established around historic eyrie sites. This is especially important where remnant populations are in easily accessible areas and will be important when reintroduction begins in areas which have lost wild nesting Peregrines.

It is evident, however, that protection alone is a meaningless gesture. The preservation of an adequate environment is essential for the continued survival of the Peregrine. Ensuring a chemically non-contaminated environment is most important as well as being the most difficult to implement.

Several management techniques have been proposed as a means of increasing wild Peregrine populations.[6] Productivity at the nest can be increased by "double clutching." This involves the early removal of the firs set of eggs to a foster parent or incubator for hatching. The wild pai can then lay and rear a second clutc and the young from artificially incubated eggs can be returned to th wild, effectively doubling the production of the wild pair. In 1974 th Canadian Wildlife Service did just thi at two Peregrine eyres (R. W. Fyf personal communication).

Because natural mortality of youn Peregrines is very high, their surviva rate could be increased by holdin them in captivity for the first 2 year They could be cared for and flown b master falconers and "hacked back (gradually acquainting young with th wild until independent) to the wild a the time of spring migration. The number surviving could probably be a least doubled by this technique wit the additional advantage of being abl to insure little or no contamination o their food in captivity with pesticides Such a program would of cours require careful coordination and administration.

A major program presently und way is the captive breeding of th Peregrine for eventual reintroductio Many projects, both institutional an private, are currently involved in captive propagation. Cornell University Laboratory of Ornithology establishe a Peregrine breeding project in 197 In 1973, they produced 20 young fro 3 adult pairs. In 1974, they produce 23 young from 5 pair of adults. So fa Cornell has achieved the greatest success in captive breeding of th Peregrine and their enthusiasm exemplified by this quote from the 1974 Newsletter:

> "A new era in man's relations wi the falcons has become possible - an era in which falconer aviculturists, conservationists ar nature lovers can join hands in common effort to preserve ar manage birds of prey for human e joyment and enlightenment."

e Canadian Wildlife Service ablished a project in Alberta in 70 for the captive breeding of eral species of falcons. They have ieved considerable success with the irie Falcon and in 1974 were suc- sful in producing Peregrines.

rivate breeding projects have neered many of the techniques in tive breeding because they are able focus their entire effort on one or pair of falcons. The first captive- d Peregrines in North America e produced in Oregon by Larry ramm's Peale's Peregrines which lged one young in 1968 and two ng in 1969. Heinz Meng, in New rk State, raised one young Peale's in 1 and seven in 1972. In 1973, his ilt pair went to Cornell's breeding ject. John Campbell of Alberta had cess with a pair of northern atums in 1973 (3 young) and in 74 (2 young). An important light of this particular breeding ject has been the excellent avioural information that has been hered by Wayne Nelson, University Calgary and John Campbell.[13] [14] eral other private projects have duced young Peregrines in both ada and the United States since 70.

he Prairie Falcon is a common eding falcon in parts of the west is similar in many ways to the egrine. It is, therefore, useful as an erimental species for trying various eding and release techniques that ht be perfected successfully enough apply to later releases of captive duced Peregrines. In Alberta, hard Fyfe is carrying out extensive earch into methods of reintroduc- n using Prairie Falcons for ex- imental trials.

n 1974, there were some releases of tive produced Peregrines to the d. Heinz Meng released a pair of ng falcons from the Faculty Tower of the State University at New Paltz, New York, hoping they would establish territory there. Unfortunately, shortly after they became independent they were killed by an unknown person.[12]

Cornell researchers placed two young Peregrines from their project into an eyrie in Colorado which had a long history of nesting failure. The young fledged normally and were observed some time later flying about their foster home.

THE FUTURE OF THE PEREGRINE

In some ways the future of the Peregrine looks bright. The halting of the decline in parts of Great Britain and the partial recovery of the Peregrine population there is encouraging. Legislation reducing the use of some persistent pesticides has been enacted in many countries including Canada and the United States. The recent advancement in captive breeding success and the continued development of other management techniques is also heartening.

We should not, however, lose sight of the fact that even species with large populations can become extinct in a very short period of time as shown by the disappearance of the Passenger Pigeon. The use of persistent pesticides is still very high in many developing countries and may be a source of contamination for our arctic migrant Peregrines. As world food production becomes further outstripped by world population increases, there may also be increased pressure to revert to widespread use of these chemicals in North America.

Hopefully, the fact that a major effort has begun while there still are viable populations of Peregrines in North America will ensure that future generations will be able to see this magnificent bird across the full extent of its former range.

The authors wish to thank R. Wayne Nelson and Richard Fyfe for many helpful suggestions about this paper.

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CALGARY BLUEBIRD TRAIL — 197

by HAROLD W. PINEL*
and CAROL J. ROBINSON**

Because of the success of the Calgary Bluebird Trail in its initial year, 1973, we decided to double the number of nesting boxes in 1974 from 191 to 382. First, all the boxes vandalized or missing from the 1973 trail were repaired or replaced. Then in early March of 1974, nest boxes used the previous year were cleaned out and sprayed with a creolin solution (1 creolin to 10 parts H_2O) to destroy and other insects. In late Marc 1974, the 191 new houses were ere in different areas as continuatio the already existing trail (Fig bringing the trail to about 220 m

Every nesting box was checked the contents recorded four time tween the 3rd week in May and th week in August.

Of the 382 boxes, 42 were dalized before nesting began, 4 nesting started and 35 were

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**Group Box 3
9th Ave. and 22nd St., S.E.,
Calgary, Alberta.

pied on all visits, leaving 301 boxes :d by birds. Excluding 42 van- lized before the nesting period, .5% of the available nesting boxes re occupied. There were 353 nests the 301 nesting boxes, some houses ing used twice.

Table 1 presents the nesting success d analysis of losses for 1974. The erage clutch size for Mountain uebirds was greater in 1974 than in 73, 5.59 vs 5.07.[1] Tree Swallow itches were about the same size, 5.78 1974 and 5.75 in 1973.[1] The largest itch was 8 eggs — in six boxes for allows and in one box for bluebirds. 18 nest boxes, there were two or re broods by the same species. Nine re occupied by House Sparrows, six Mountain Bluebirds, and three by ee Swallows. Two species nested in : same box in 25 instances, as lows: sparrow then swallow, 11; irrow then wren, 1; swallow then irrow, 4; swallow then wren, 3; allow then bluebird, 1; bluebird :n swallow, 4; bluebird then irrow, 1. In 12 of these occurrences use Sparrow nests had been stroyed on previous visits.

Numerically, the total losses for all ecies incurred from the egg-laying ge to the time that the young left the t were greater in 1974 than in 1973, : percentage-wise they were much s, 47.7% in 1973 as compared to 8% in 1974. Remember that these ures are the total losses; they would much less if all House Sparrow ts, eggs and young had not been troyed. The large increase in suc- s during 1974 was the result of ch smaller losses by Tree Swallows. e flies which infested the swallows ring 1973 were a minor problem in 74, possibly as a result of our disin- tion program or, perhaps, the flies iply had a poor year. The Mountain iebird losses, on the other hand, wed an increase. This was the result poor weather conditions in the ing which caused some birds to desert their nests and others to apparently delay nesting. The delay was significant because Tree Swallows then arrived on the scene and, in many

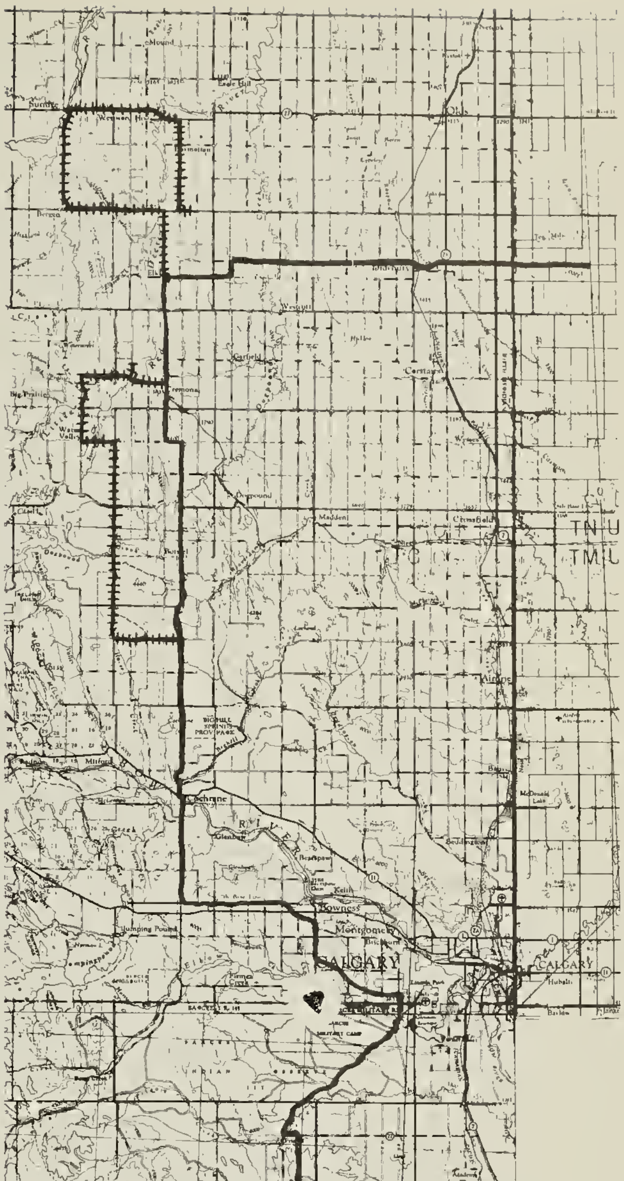

Fig. 1 Route of Calgary Bluebird Trail (— 1973 Trail; ⧺ 1974 Extensions of Trail).

Table 1. Summary of Nesting Success by Species, Calgary Bluebird Trail, 1974. (Number in parenthesis are losses from the previous stage.)

Species	*Nests*	*Eggs Laid*	*Eggs Hatched*	*Young Fledged*	*Young Le Ne*
Mt. Bluebird	54	302	216(86)	214(2)	214(
Tree Swallow	242	1399	1194(205)	1131(63)	1131(
*House Sparrow	49	201	78(123)	3(75)	3(
House Wren	8	32	29(3)	29(0)	29(
Totals	353	1934	1517(417)	1377(140)	1377(

*Destroyed by authors.

cases, out-competed bluebirds for the boxes.

An interesting event occurred in nest box No. 145, located approximately 2 miles east of Elkton. On May 22, the box was empty except for a few pieces of grass. On June 13, a Tree Swallow flushed out of the box which contained a Mountain Bluebird nest with 2 bluebird eggs and 1 swallow egg. On July 4, the box contained 1 bluebird egg and 2 young bluebirds, and a pair of Tree Swallows was observed carrying food to the young. On August 7, the nest contained the single bluebird egg and many droppings, leading us to conclude that a pair of Tree Swallows had successfully raised two young Mountain Bluebirds.

In summary, by doubling the nur
ber of nest boxes in 1974, we ha
hoped to double the number of you
leaving the nest. In fact, the resu
showed an increase of 3.2 times t
number of young leaving the nest. Th
may be attributed to: (a) the increa
in occupancy rate from 85% to 88.5
(b) the slight increase in avera
clutch size of the bluebirds a
swallows, (c) the decrease in va
dalism from 26.2% to 12%, a
(d) the decrease in losses, mainly t
result of a much-reduced fly proble

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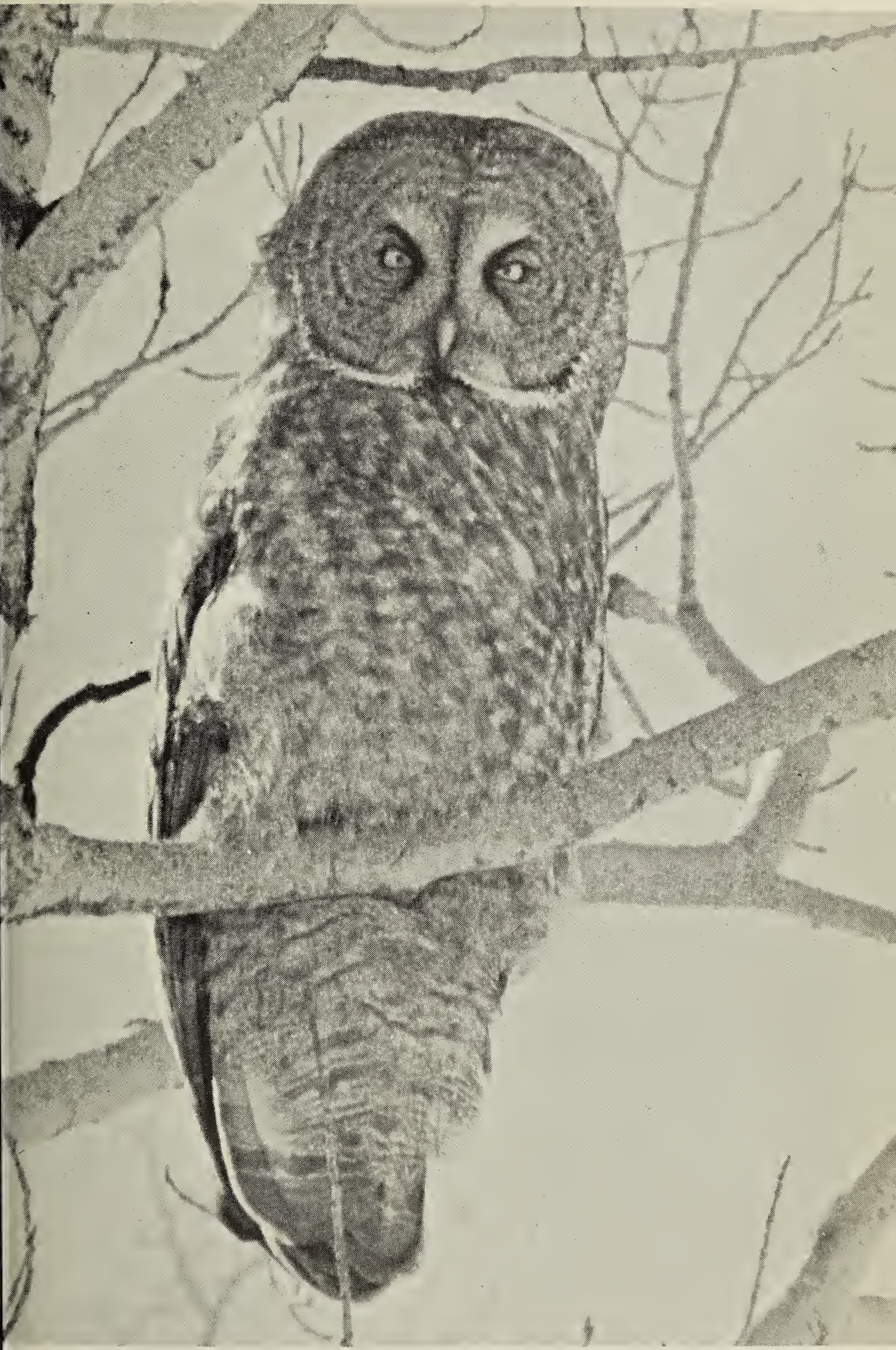
[1] PINEL, H. W. and C. J. ROBINSON, 19
Calgary Bluebird Trail. Blue Jay, 32: 108-11

PRAIRIE NEST RECORD SCHEME

1975 cards for everyone interested in recording nest data in Alberta Saskatchewan, Manitoba and the Northwest Territories are now availabl with instructions and a summary for 1974 from:

The Prairie Nest Record Scheme,
c/o Manitoba Museum of Man and Nature,
190 Rupert Avenue,
Winnipeg, Manitoba. R3B 0N2.



eat Gray Owl. Lac du Bonnet, Manitoba, March, 1974. Andrew Lindsay

POSSIBLE INTRA-SPECIFIC KILLING BY A GREAT GRAY OWL

by ROBERT M. FISHER*

On January 23, 1974, at 12:00 p.m., I observed a possible case of intra-specific "predation" by a Great Gray Owl. The location was 15 feet off Highway 93 (Lat. 117°26' Long. 52°27') at 5000 feet above sea level in Jasper National Park, Alberta. The ambient air temperature was about −3°C (26°F), with a southwest wind gusting to 20 mph.

The observation of a Great Gray Owl standing on top of a dead Great Gray Owl was made from a bus containing 20 students. Upon stopping the bus, the feeding bird flew off. Examination of the site did not reveal any signs of a significant struggle. The thin body of the dead owl was still warm. No blood was found, nor were broken bones or external hemorrhages present. A small area of skin had been opened on its breast, and there was a hole approximately 1.5 inches in diameter in the ear area. Feathers were scattered in small quantities downwind from the site.

This observation implies one of at least two things: 1) The owl was feeding on carrion or 2) The owl preyed upon an individual of its own kind.

The Great Gray Owl preys almost entirely on mice and voles. [1 2 3 5 6 7 9] In some cases birds have been found to constitute small portions of the Great Gray Owls diet: Common Crow,[1] Redpoll,[4] and Hazel Hen.[8] The taking of birds by Great Gray Owls must be assumed to be uncommon; of 4,026 prey items examined in their study of pellets, Mikkola and Sulkava found 1.1% avian remains, including finches, adult and young game bir (*Tetraonidae*), two jays (*Garrulus gla dularis*) and a Tengmalmis O (*Aegolius funereus*).[8] In Canad however, Brunton and Pittaway h not observed the Great Gray Owl feed on birds.[2]

One could assume that the dead o may have been hit by an automobi but park wardens informed us that t road had been closed to public tra up to this date because of danger fr avalanches. We were the fi travellers on it for some time, ot than the wardens. This informati and the lack of external hemorrha suggest that the Great Gray Owl tacked and killed an individual of own kind, possibly an individ diseased or starved to a point wh the live bird responded to its abnorr behavior.

My thanks to R. W. Fyfe and A. Oeming for their helpful remarks reviewing the manuscript.

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SASKATCHEWAN CHRISTMAS MAMMAL COUNT, 1974

Compiled by WAYNE C. HARRIS[1]

Mild weather and almost no snow ver in some localities resulted in exlent results on counts this year. A al of 16 localities reported 15 cies of mammals, almost doubling t year's coverage. The lack of snow ver resulted in observation of eral species of small mammals not orded last year, including the adow Vole and Deer Mouse.

he most frequently recorded cies, the White-tailed Jackrabbit, nains common in most areas and the wshoe Hare populations appear to increasing again. Coyotes also apr to have shown an increase, being recorded on nine counts compared to two last year.

For weather, coverage and participants, please refer to Christmas Bird Counts elsewhere in this issue.

Symbols found in the table:

* Identified by tracks (number of animals by tracks in parentheses).

+ Seen during count period but not on count day.

Saskatchewan Christmas Mammal Count

	Besnard Lake	Biggar	Big Gully Creek (at the mouth)	Borden	Harris	Kutawagan Lake	Last Mountain Lake	Luseland	Maidstone Ferry	Moose Jaw	Raymore	Saskatoon	Snowden	Spirit Lake	Wauchope	White Bear	Total Locations
d Fox	—	—	*(1)	—	2	—	*(1)	1	—	*(3)	—	2	—	—	—	—	6
yote	—	—	3	—	5	*	*(1)	—	*(5)	*(3)	*(2)	4	—	*(3)	—	—	9
asel sp.	—	—	*(2)	1	1	*	—	*	*(4)	—	*(3)	—	—	*(2)	*(5)	—	9
nk	—	—	*(1)	—	—	—	*(1)	*(1)	*(1)	—	—	—	—	—	—	—	4
iped Skunk	—	—	—	—	—	+	—	—	—	—	—	—	—	—	—	—	1
ıx	—	—	*(1)	—	—	—	—	—	*(1)	—	—	—	—	—	—	—	2
iite-tailed Jack Rabbit	—	1	—	—	4	6	*	6	*(2)	*(4)	*	1	—	*(6)	—	—	10
wshoe Rabbit	—	—	*(3)	1	5	—	—	1	*(6)	*(3)	*	5	—	*(5)	*(1)	—	9
d Squirrel	6	—	17	1	—	—	—	—	*(1)	*(1)	—	—	1	2	—	—	7
aver	—	—	—	—	—	—	—	—	—	—	—	4	—	—	—	—	1
er Mouse	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1
adow Vole	—	—	1	—	1	—	1	—	—	—	—	1	—	—	—	—	4
rcupine	—	—	*(1)	*	—	*	*(1)	*(1)	—	—	*(1)	3	—	*(1)	—	—	8
ıle Deer	—	1	—	—	6	—	—	—	—	—	—	—	—	—	—	10	3
iite-tailed Deer	—	—	*(5)	—	9	*	*(2)	*(1)	*(2)	—	3	—	—	3	*	—	9
tal Species	1	2	10	4	9	6	7	7	7	6	6	7	1	7	3	1	

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[1] Box 93,
Raymore, Saskatchewan.
S0A 3J0

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ndhill Crane Refuge, Nebraska — The Interior Department is moving ahead wly to acquire land from willing sellers (Gov. J. James Exon will withdraw his pport if Federal officials try to condemn key parcels).

From *National Wildlife.*

SURVIVAL OF SMALL MAMMALS IN A CONIFEROUS FOREST BURN

by ROBERT E. WRIGLEY*

Abstract: Six species of small mammals survived a forest fire in the forest-tundra transitio
of northern Manitoba by occupying a refugium of zonal pond vegetation. Critical factors i
the continued survival of the two insectivores (Masked Shrew and Water Shrew), tw
granivores (Red Squirrel and Meadow Jumping Mouse), and two herbivores (Gapper Re
backed Vole and Meadow Vole) appeared to be utilization of separate microhabita
(pond, marsh, shrubs and trees) and exploitation of different, though overlapping, sets
food resources.

During August, 1974, biological studies were conducted by a museum team at Southern Indian Lake in northern Manitoba. The south half of the 144-kilometer (89-mile) lake lies within the boreal coniferous forest biome while the north half is forest-tundra transition. The region has been subjected to repeated forest fires and the resulting mosaic of post-burn communities offers excellent opportunities to study recolonization and succession of taiga plants and animals. This report deals with a population of small mammals which apparently found refuge from a forest fire by retreating to a narrow band of wet vegetation lining a small pond near the northern end of the lake (57° 29'N, 98° 34'W).

The elongated pond of about 0.8 hectares (2 acres) in size lay in a steep-sided valley in the Kame Hills, completely surrounded by a 35-meter-high (115-foot) sand esker and adjacent sandhills of glacio-fluvial origin (Fig. 1). The pre-existing forest consisted of Jack Pine (*Pinus banksiana*) on the hilltops, Black Spruce (*Picea mariana*) and Paper Birch (*Betula papyrifera*) on the slopes and valleys; a shrub layer
Mountain Alder (*Alnus crispa*) ar
Labrador Tea (*Ledum groenlandicu*
and a ground cover of mosses, liche
and herbs (Fig. 2). The pond suppo
ted a marsh of predominantly sed
(*Carex aquatilis*), Wild Calla Li
(*Calla palustris*), Marsh Five-fing
(*Potentilla palustris*), and Water Pa
snip (*Sium suave*); thickets of willo
(*Salix* spp.) and alder; and Tamara
(*Larix laricina*) and Black Spruce e
croaching onto the sedge mat.

The fire occurred about 1964 a
burned inland for several kilomete
leaving a layer of ash and a tangle
charred, standing and fallen trees
the sandhills. The only vegetation
survive in the vicinity of the pond v
a sedge marsh, a willow-alder thick
and about 30 spruce trees grow
along the margin of the pond. Due
the very steep sides of the esker a
hills, this peripheral green zone v
only 2 to 8 meters (7 to 26 feet) wi
The nearest unburned sites were ot
inland ponds (1.6 km (1 mile) dista
and an alder-willow thicket growin
the edge of Southern Indian Lake (
km (0.3 mile) distant) with numer
sandhills in between.

By 1974, underground stems
alder, willows, paper birch, a
Labrador tea that survived the fire l

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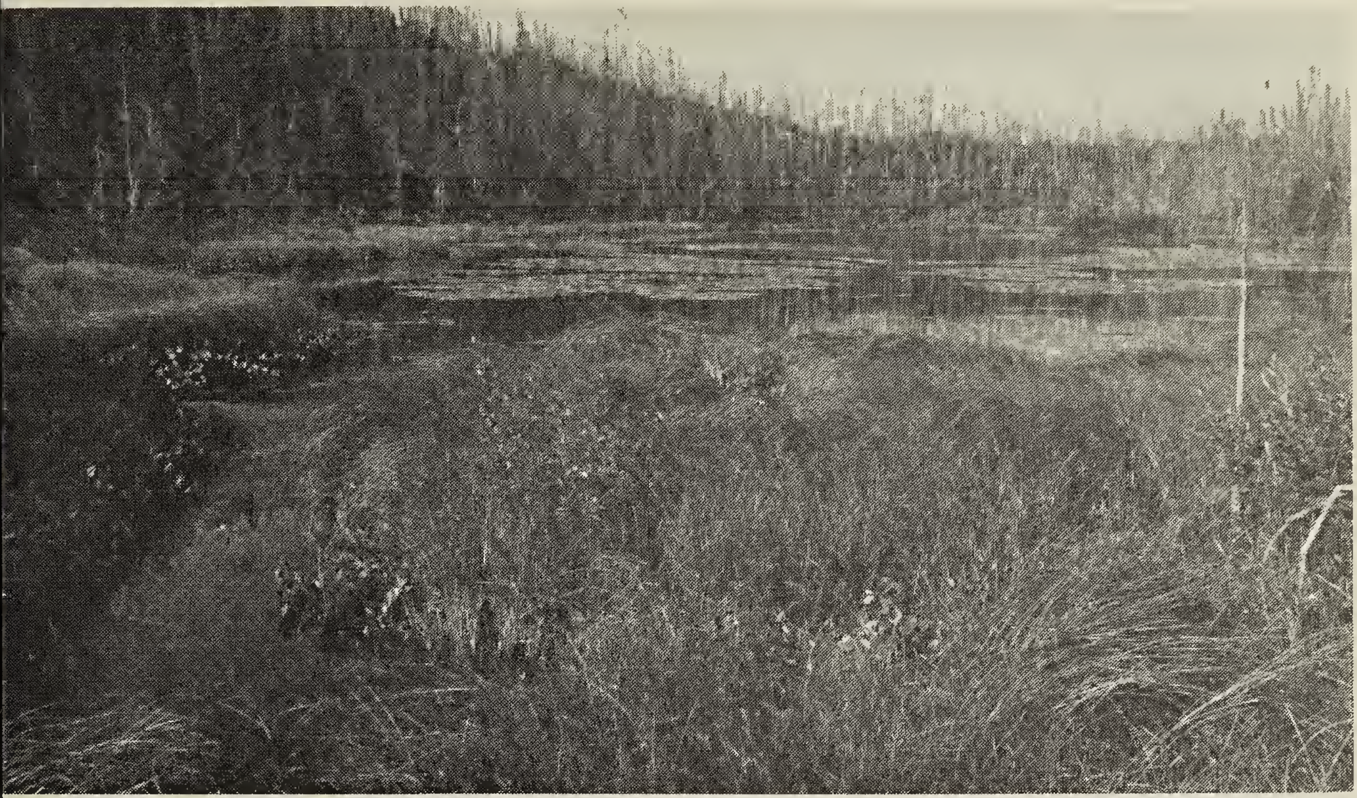
*Manitoba Museum of Man and Nature,
190 Rupert Avenue,
Winnipeg, Manitoba.
R3B 0N2



g. 1. Pond lying along the northern base of a sand esker. The narrow zone of marsh,
hrubs, and a few black spruce survived a forest fire which swept through the region 10
ears ago.

2. A mature Black Spruce forest
ninimum age of 150 years) in the same
cinity as the 10-year-old burn. Judging
the size and spacing of the trees, this
rest was similar to the original forest
rrounding the pond.

sprouted shoots 0.5 to 1.5 meters (1.6 to 4.9 feet) high, and Jack Pine seedlings had reached a height of 1 meter. Numerous early successional plant species had invaded the hillsides but 50 to 75 percent of the ground was still bare sand, ash and charcoal.

In order to determine the kinds of mammals inhabiting the pond margin, 260 museum special traps were set for 3 nights in the marsh, shrub and tree communities. The following were collected: 6 Masked Shrews (*Sorex cinereus*), 5 Water Shrews (*Sorex palustris*), 1 Gapper Red-backed Vole (*Clethrionomys gapperi*), 11 Meadow Voles (*Microtus pennsylvanicus*), and 15 Meadow Jumping Mice (*Zapus hudsonius*). Six Red Squirrels (*Tamiasciurus hudsonicus*) were observed for a total of 44 small mammals. Chewed birch stumps and an abandoned beaver lodge overgrown with sedge revealed that a Beaver (*Castor canadensis*) had either succumbed to the fire or departed with the resulting destruction of its food supply.

Considering the great distances to

the nearest unburned regions, the rugged terrain, and the sparseness of the vegetation recolonizing this secondary bare area, it is probable that the species of small mammals found at the pond did not arrive after the burn, but survived the fire by retreating to the narrow band of wet vegetation. The period of intense heat and suffocating smoke must have been avoided by shrew, mouse, and tree squirrel alike through the use of cool burrows. It is surprising, firstly, that these mammals survived within a few meters of the fire and, secondly, that they were able to persist in such small numbers for many generations in a narrow zone at the edge of the pond. Of critical importance must have been the fact that each species used a different, though overlapping, set of food resources and occupied a separate microhabitat from the others. All available environments were exploited — pond, marsh, shrubs and trees.

The six species of mammals consisted of two insectivores, two granivores and two herbivores. The Masked Shrew and Water Shrew, though both insectivorous, select many different insect and other invertebrate prey not only as a result of the dissimilar size of the two shrews, but also because of habitat preference. The Masked Shrew is found throughout all terrestrial communities present (most commonly in the sedge mat), while the Water Shrew seldom strays far from water and all five specimens were collected in the marsh and hydric shrub thickets. In addition, the Water Shrew enters the aquatic environment, at least when the pond is not frozen to the bottom, to feed on pond life not utilized by the other mammals.

The Red Squirrel and Meadow Jumping Mouse feed on a variety of seeds, berries, fungi and animal material as these resources become available throughout the year. However, partial segregation of diets would result from their body-size differential, plus th fact that the squirrel's basic food ite of Black Spruce seed is largel unavailable to the mice, the cone remaining out of reach on the tree until all the seeds have been scattered b the wind. The jumping mouse avoid competition for food and denning site during the critical winter months b hibernating deep in the sandy hillsid for about 7 months of the year at thi latitude.

The two voles devour green plan material, roots, and bark, but they ar usually well segregated by habita preference. As expected, the 1 Meadow Voles were captured in th sedge marsh, the single red-back in th shrub thicket.

Devastating and widespread fores fires are of common occurrence in th transitional zone between the borea coniferous forest and the tundra. Th ability of the six most-abundan species of small mammals to retreat t and then persist together in a sma green oasis, surrounded by a charre sandy "desert", reveals the crucial rol that niche segregation plays in the su vival of mammal populations in th face of reoccurring, major habita destruction. It also demonstrates th adaptability of each species to surviv within a small refugium (precariously low numbers) until th appropriate stage of plant successio once more permits dispersal over fo mer range.

Acknowledgements: I would like thank the other members of the fie crew for their assistance in this stud Ernest Walker, Jack Dubois and He Copland trapped mammals ar prepared study specimens, and D Karen Johnson was very helpful identifying plants. Garry Dickson the Churchill Diversion A chaeological Project kindly ma available maps and pertinent inf mation about the Kame Hills regior

LORAN L. GOULDEN, ALBERTA NATURALIST

by MARTIN K. McNICHOLL*

The tragic death of Loran L.
ulden in a plane crash on Riddle
untain, B.C. on August 1, 1974,
ought to a close a short, but
nificant chapter in the history of
tural history in Alberta. Loran was a
fessional photographer of outstan-
ng merit, but devoted most of his
re time in his last 3 years to bird
dy. He became a professional
turalist shortly before his death,
en he joined an environmental con-
ting firm in Edmonton.

Loran's contribution to nature study
Alberta, and especially in Edmon-
, cannot be overstated. He initiated
d edited regular faunal reports for
northern half of Alberta,
blishing these in the *Edmonton*
turalist. For these reports he co-
erated with the Provincial Museum
d Archives of Alberta in designing
Alberta Animal Record Card.
ese cards and reports are a con-
uing memorial to Loran's memory.
ran also initiated an extensive series
workshop-style classes in various
ects of nature, co-sponsored by the
monton Natural History Club and
Provincial Museum. He personally
nducted the most popular and time-
nsuming of these: birds of Alberta.
January, 1973, Loran was elected
esident of the Edmonton Natural
story Club, a post which he still held
his death. His contributions to the
ub far exceeded those expected of a
esident. Loran was also a Director
the Federation of Alberta
turalists and Chairman of FAN's
dangered Species Committee.

His more academic pursuits in-
ded the running of a bird study plot
Elk Island National Park for the
nter and breeding birds censuses
blished annually by *American Birds*, contribution of several maps to a book on the early winter distribution of birds in North America, and conducting a route for the Breeding Bird Survey of the U.S. Fish and Wildlife Service and Canadian Wildlife Service. He published articles in the *Alberta Naturalist, Blue Jay*, and *Auk*, as well as the *Edmonton Naturalist*, for which he was faunal editor. He also published a book review in the *Canadian Field-Naturalist* and was on the editorial board of *Western Birds*.

A much more complete account of Loran's brief, but productive career is detailed in an article by this writer in the first 1975 issue of the *Alberta Naturalist*.

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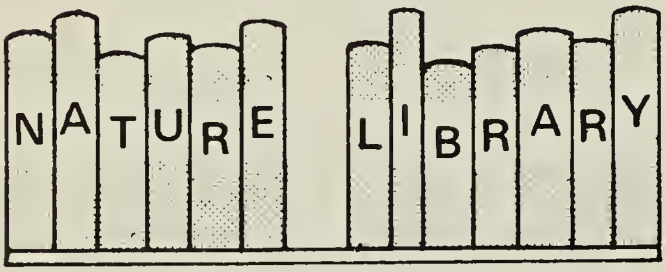
30 Years Ago

From the 11-page mimeographed *Blue Jay* of January-February-March, 1945, come the following notes:

Some young members of the Yorkton N.H.S. counted muskrat houses for Ducks Unlimited on November 9, 1944. There were 353 houses on Upper Rousay Lake (169 the year before) and 223 on Lower Rousay (compared to 25 in 1943) . . . Don Knox estimated that 5,000-6,000 ducks were killed on November 15 at Clair apparently as they attempted to land (at night) in a stubble field covered with hoar frost under a sky of thick fog and smoke . . . Bounties of 5 cents each were paid on 1,092 woodchucks by the RM around Tisdale in 1944 . . . Lindsay and Bill Wotherspoon of Hyas caught a chickadee in 1937 that they had banded 5 years earlier . . . In 1942 Arthur Ward of Burnham recaught two robins that he had banded in 1940 and 1941.

Twenty-eight people reported 33 species of birds in 12 Saskatchewan Christmas Counts in 1944. The location of each count, number of species ( ) and the participants were as follows: *Grenfell* (5) Mr. and Mrs. John Hubbard, Jr.; *Hawarden* (3) Harold Kringe; *Indian Head* (4) Bill Wilson; *Raymore* (3) Miss E. K. Jones; *Nipawin* (18) Maurice Street; *Scott* (6) F. Rouse; *Skull Creek* (19) Steve Mann; *Torch River* (12) Stuart Francis; *Tullis* (10) Mr. Lillian Verrault, L. J., W. S. and Frank Roy; *Wallmont* (13) John Ritchie; *Wolseley* (7) John Garden; *Yorkton* (11) Ray Adam, Vernon Barnes, Neil Black, Jack and W. A. Brownlee, Brother Clarence, Stuart and Dr. C. S. Houston, Mrs. J. Meekma, Michael and Mrs. I. M. Priestley, Mr. and Mrs. C. C. Shaw.



TO THE ARCTIC BY CANOE 1819-1821.

The journal and paintings of Robert Hood midshipman with Franklin.

Edited by C. Stuart Houston,
The Arctic Institute of North America,
McGill-Queen's University Press.
Montreal and London.
1974. 217 pp.

When Samuel Hearne reached the Arctic Ocean at the mouth of the Coppermine River in 1771 after an overland journey from Fort Churchill, he ended for all time Europe's hope that there was a navigable strait connecting the Pacific Ocean with the west coast of Hudson Bay. It was almost a half century later, following the conclusion of the Napoleanic wars at Trafalgar in 1815, that England resumed search for the Northwest Passage. Those who were interested i a commercial water route to the Orien now hoped to find it north of Hudso Bay.

As part of this renewed effort, small ill-equipped expedition lef England in May, 1819, with orders t map the north coast of North Americ east of the Coppermine River. The ex pedition consisted of Lt. Joh Franklin, commanding officer; D John Richardson, surgeon an naturalist; midshipman George Bac midshipman Robert Hood; an English seaman John Hepburn.

The expedition reached the Arcti coast in July, 1821, after a 2-year jou ney through the Canadian fur countr and in a month of exploration mappe 675 miles of coastline along the sout shore of Coronation Gulf and Bathur Inlet.

Ten men died that fall on the retu journey, generally from starvation an exposure; but four of them were a parently murdered, including Robe Hood, and the suspected murderer w shot by Dr. Richardson. Lt. Frankl published a complete account of t expedition entitled "Narrative of Journey to the Shores of the Polar S in the Years 1819, 20, 21 and 2 and his account of the hardships their journey including charges murder and allegations of cannibalis created a sensation in Europe.

Hood's journal covers the first tv seasons of the expedition's travel. It a polished manuscript, obviously wr ten for publication probably from diary or notes which have not su vived. Parts of Hood's manuscri were used by Franklin in his book, b most of the manuscript is publish here for the first time.

Hood's journal contains five cha ters describing the expedition's trav from England to Fort Enterpriz north of Great Slave Lake, in 18 and 1820. One chapter recounts winter activities at Cumberland Hou and a later winter hunting trip to t Pasquia Hills. There is a chapter the Cree Indians and one entitled "T Buffalo, Climate, Aurora Boreal Magnetic Phenomena".

Twenty-four water colours by bert Hood are included in the lume, 20 of which have not been blished before.

The editor has added a short logue describing the circumstances rounding the death of Hood. There a brief commentary on the water our paintings and a short account of lives of the men of the expedition. ur excellent maps show the exdition's route of travel from gland until the death of Hood.

The book is elegantly designed and ndsomely printed. It has been well ited by Dr. C. Stuart Houston, a diologist at the University of Saskatewan. The footnotes are generally lpful and informative. Those on the rora borealis and magnetic enomena were particularly lightening and interesting.

The book is a pleasure to read. od's description of travel through stern Canada in the era of the fur le is fresh and fascinating. His acunt of life at Cumberland House 150 rs ago, and of a winter trip to the quia Hills with Indian hunters should be of particular interest to residents of Saskatchewan.

I strongly recommend this book to anyone interested in Arctic exploration or the early history of Saskatchewan and western Canada.

W. J. MAHER,
Biology Dept., Univ. Saskatchewan,
Saskatoon, Sask.

BIRDING FROM A TRACTOR SEAT

By C. T. Flugum

Published by Author
Box 3008,
St. Paul, Minnesota.
435 p. 1973.

The author is a Minnesota farmer. He describes his day to day observations of birds as he goes about his farm work. Observations, he says, can be made from a tractor seat as in no other way. He is a keen observer and each experience is told in an interesting and very readable style. It is a book of 137 essays originally written as a monthly column for a magazine. Very enjoyable and highly recommended. — *J. Donald Hayward*, Box, 389, Wolseley, Saskatchewan.

READING ABOUT BIRDS

by DIANE SARICH*

ncreasing one's knowledge of birds and their habits can greatly improve the asures of birdwatching. The Saskatoon Public Library has many books about ds. The following books would serve as an identification guide for most of the cies found in this area.

UUN, Bertel. *Birds of North America:* a le to field identification. 1973. 96 p. chapter, "The Prairies", begins on page

598.297 B913

DFREY, W. Earl. *The birds of Canada.* 6. 428 p. Information on the ranges, habitat preferences and nesting of 519 Canadian bird species. (Another copy in Reference.)

OS 598.2971 G583

MACKAY, Barry K. *Eighty more land birds to know.* 1968. 83 p. A companion volume to the book by S. L. Thompson.

598.297 M153

MAY, Charles P. *A book of Canadian birds.* 1967. 115 p. Where to look and how to recognize 28 common birds found in Canada.

Y598.2971 M466

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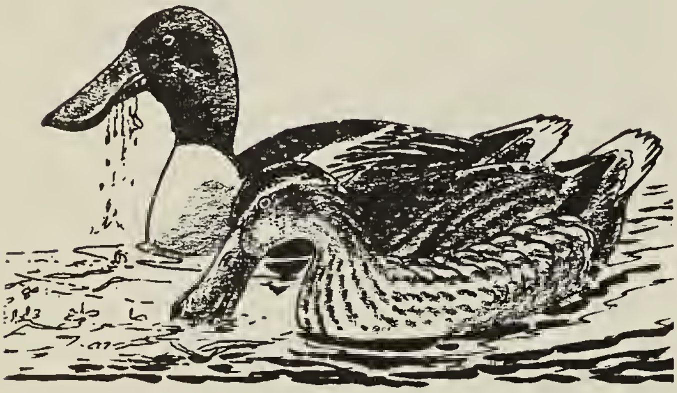
katoon Public Library,
Ave. and 23rd St.,
katoon, Saskatchewan.

PETERSON, R. T. *A field guide to western birds*. 1969. 366 p. One of the two best identification guides.
598.2 B485



ROBBINS, C. S., B. BRUUN and H. S ZIM. *Birds of North America — A guide t field identification*. 340 p. One of the tw best identification guides.

THOMPSON, Stuart L. *Eighty land birds t know*. 1958. 90 p. A book designed fo beginners which has a page on each bir with a picture and a brief descriptio (Another copy in Young Peoples.)
598.297 T47

THOMPSON, Stuart L. *160 birds to kno* 1970. 200 p. An illustrated guide co taining the scientific names, size, famil voice, habitat, and range of each bird.
598.297 T467

The library also has books which contain specific information about bird behaviour, their songs, flight, and music.

ARMSTRONG, Edward A. *Bird display and behaviour*, an introduction to the study of bird psychology. 1965. 431 p.
Y598.2 A735

BURTT, Harold E. *The psychology of birds;* an interpretation of bird behaviour. 1967. 242 p.
598.251 B974

CROMER, Richard. *The miracle of flight*. 1968. 159 p. The aerodynamics of flight and how the bird is physically structured for it.
Y598.2 C945

HARTSHORNE, Charles. *Born to sing;* an interpretation and world survey of bird song. 1973. 304 p. A detailed rating of nearly 200 species with highly developed songs.
598.259 H335

KAUFMANN, John. *Birds in flight*. 197 96 p. The anatomy of a bird, and the basi aerodynamic principles involved in bir flight.
Y598.21 K2

MATHEWS, Ferdinand S. *Field book wild birds and their music;* a description the character and music of birds, intende to assist in the identification of speci common in the United States east of th Rocky Mountains. 1967. 325 p.
598.259 M42

SPARKS, John. *Bird behaviour*. 1970. 159 The cleaning, feeding, courting, matin and migrating habits of a variety of birds
598.25 S73

TERRES, John K. *Flashing wings;* t drama of bird flight. 1968. 177 p.
598.21 T32

There are several books available at the Saskatoon Public Library on Saskatchewan birds. A few of the books on birds of a specific area are available only in the Reference Department or the Local History Room and must be used in the library.

GILROY, Doug. *An album of prairie birds*. 1967. 71 p. A display of prints by the author. (Another copy in Reference).
598.29712 G489

GODFREY, W. Earl. *Birds of the Cypress Hills and Flotten Lake regions, Saskatchewan*. 1950. 96 p.
R598.2971243 G583c

KNIGHT, Leigh M. *Birds of the Moose Jaw area*. 1967. 73 p.
LH598.2971 K71

NERO, R. W., and M. R. LEIN. *Birds of Moose Mountain, Saskatchewan*. 1971. S.N.H.S. Special Publication No. 7. 54 p.
R598.2971 N449m

NERO, Robert W. *The birds of northeaste Saskatchewan*. 1967. S.N.H.S. Speci Publication No. 6. 96 p. (Another copy Reference).
598.2971 N4

RICHARDS, John Howard, ed. *Atlas Saskatchewan*. 1969. 236 p. On pages through 88 there are maps showing t breeding ranges of the 242 species of bir that breed in Saskatchewan and t migration, winter, and summer ranges the 44 species that don't breed he (Another copy in Reference and Lo History).
912.7124 R5

Y, J. Frank. *An introduction to the birds he Elbow.* 1964. 33 p.
R598.2971 R888

SKATCHEWAN. Department of ural Resources. *Birds of Cypress Hills vincial Park.* 1961. 13 p.
R598.2971 S252c

SKATCHEWAN. Department of ural Resources. *The resource reader.* The section of this book is on birds. There two general articles: "The art of attrac- birds" and "Bird houses". The rest of articles are about the individual species birds found in Saskatchewan.
R333.7097124 S252

BELCHER, Margaret. *Birds of Regina.* 1961. S.N.H.S. Special Publication No. 3. 76 p. (Another copy in Reference).
598.2971 S252B

NERO, R. W. *Birds of the Lake Athabasca region, Saskatchewan.* 1963. S.N.H.S. Special Publication No. 5. 143 p.
R598.2971 S252n

HOUSTON, C. S., and M. G. STREET. *The birds of the Saskatchewan River, Carleton to Cumberland.* 1959. S.N.H.S. Special Publication No. 2. 205 p.
R598.2971 S252

Birds may be attracted to a garden when their needs for water, food and safety e satisfied. Some books which would be helpful in this area are:

RBIB, Robert S. *The hungry bird book.* 71. 126 p. How to turn a garden into a ar-round sanctuary for wild birds.
598.2 A664

RRINGTON, Rupert. *The joys of a gar- n for your birds.* 1972. 123 p.
598.2073 B276

RTON, Roger. *How to watch birds.* 1961. 1 p.
598.2073 B293h

LLINS, Henry H. *The bird watcher's de.* 1961. 123 p.
Y598.2 C712

LLINS, Henry H. *Familiar garden birds America.* 1965. 309 p.
598.297 C712

VISON, Verne E. *Attracting birds:* from prairies to the Atlantic. 1967. 252 p. e food preferences and nesting sites of re than 400 species of birds. (Another copy in Reference).
598.2072 D265

McELROY, Thomas P. *The new handbook of attracting birds.* 1970, C 1960. 262 p.
598.201 M141

SCHULTZ, Walter E. *How to build birdhouses and feeders;* and how to attract birds to your gardens. 1955. 134 p.
598.2013 S396

SIBLEY, Hi. *102 bird houses and feeders you can make.* 1967. 96 p. Plans for structures suited to the nesting and feeding requirements of many species of birds. (Another copy in Reference).
728.9 S564

TERRES, John K. *Songbirds in your garden.* 1968. 256 p. How to feed the birds and build bird houses, feeding stations, bird baths and watering fountains.
598.2 T325

The following books relate the experiences some people have had with birds in nada.

LLIDAY, Hugh M. *Bird land.* 1964. 3 p. One of Canada's distinguished uralists shares his adventures among ds in their natural habitats.
598.2 H188B

OR, Hance R. *I live with birds.* 1968. 172 A record of the author's lifetime of in- vement with birds at his Windinglane d Sanctuary near Erindale, Ontario.
598.29713 I96

MONS, Robert D. *Hours and the birds;* a katchewan record. 1967. 224 p. A ord of observations between 1914 and 6 of Saskatchewan birds, illustrated by author's own sketches. (Another copy in cal History).
598.2971 S988

LAWRENCE, Louise de Kirilene. *The lovely and the wild.* 1968. 228 p. The feeding, flight, nesting and migration habits of the birds in Ontario's Pimise Bay region.
598.29713 L421

RICHARDSON, Evelyn M. *Living island.* 1965. 216 p. Ten years of birdwatching on Bon Portage Island, Nova Scotia, by the wife of the lighthouse keeper.
598.297162 R522

SASKATCHEWAN NATURAL HISTORY SOCIETY
Financial Statement — Year Ending September 30, 1974.

INCOME

Memberships (including sales of *Blue Jay*)		$7,249.82	
Memberships (extra re: supporting and sustaining)		2,174.44	$ 9,424.26
Spec. Pub. No. 1 Guide to Sask. Mammals	$ 81.50		
Spec. Pub. No. 2 Birds of Sask. River	4.65		
Spec. Pub. No. 3 Birds of Regina	52.40		
Spec. Pub. No. 4 Blue Jay Index	6.00		
Spec. Pub. No. 5 Birds of Lake Athabasca	27.00		
Spec. Pub. No. 6 Birds of N.E. Saskatchewan	58.90		
Spec. Pub. No. 7 Birds of Moose Mountain	23.60		
Publication — Hours and the Birds	756.49		
Publication — Birds of the Elbow	4.69	1,015.23	
Donations: General		558.35	
1974 Summer Meeting (Estevan) (net)		140.85	
Interest (Savings account and bonds)		800.42	
Sales from Blue Jay Bookshop	6,969.72		
Less: Cost of sales	5,055.48		
Gross profit (27.4% of sales)	1,914.24		
Less: Postage, advertising, supplies, etc.	564.38		
Honoraria: $489.35, 11.59	500.94		
Net profit (12.2% of sales)		848.92	3,363.77
			12,788.03

EXPENSE

Printing of *Blue Jay* (4 issues)		6,750.33	
Adv. and promotion: Newsletter (4 issues)	1,379.52		
Grasslands Park brochure	105.12	1,484.64	
1973 Annual Meeting (Saskatoon)		36.07	
Honoraria: $600.00, 100.00		700.00	
Postage		472.42	
Office supplies and stationery		229.52	
Office equipment: addressograph plates		150.68	
Bank charges re: US discount		5.62	
Affiliation fees		65.00	
Miscellaneous office and admin. expenses		153.94	10.048.22

EXCESS OF INCOME OVER EXPENDITURE	2,739.81

Statement of Assets and Liabilities as at September 30, 1974

ASSETS

Cash on hand (Bookshop)		$ 40.00
Cash in bank (chequing) — SNHS	$6,419.03	
— Bookshop	843.93	
Cash in bank (savings) — SNHS	6,436.32	13,699.28
Canada Savings bonds		5,000.00
Stock on hand (Bookshop)		1,417.11
Accounts receivable ($564.81 less prepaid orders $118.75)		446.06
Deposits with Postal Department ($100.00, 150.00)		250.00
		20,852.45

LIABILITIES

Trust Fund re: Sanctuaries and Conservation Areas			
Balance at September 30, 1973		4,696.13	
Plus donations during past year		36.00	
		4,732.13	
Big Gully Sanctuary — 1974 lease	390.00		
Donations re: 1974 expenses	351.14	38.86	4,693.27
Marion Nixon Memorial Fund			735.00
Donations in support of special publications (1973-74)			800.00
Sandhill Crane Migration Camp			72.50
Midwest Litho Ltd. (estimate re: Sept. Blue Jay)			1,650.00
Education Tax			50.21

NET WORTH

Balance at September 30, 1973	9,070.93	
Plus tax adjustments on *Blue Jay* for 1973	1,040.73	
Plus surplus for year ending September 30, 1974	2,739.81	12,851.47
		20,852.45

SASKATCHEWAN NATURAL HISTORY SOCIETY

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